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DENTAL SCIENCE,

EDITED BY

F. J. S. GORGAS, M. D., D. D. S.
RICHARD GRADY, M. D., D. D. S

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ARTICLE I.—ORIGINAL.

MARYLAND STATE DENTAL ASSOCIATION.

The annual session was held May 9 and 10, 1892, in St. James' Hotel, Baltimore; Cyrus M. Gingrich, D.D.S., President, in the chair; W. W. Dunbracco, D.D.S., Secretary.

PRESIDENT GINGRICH'S ADDRESS.

Gentlemen of the Maryland State Dental Association:

As it is the custom that the presiding officer of our Association deliver an address, in conformity thereto only a few moments of your time will be occupied making a few suggestions for your consideration.

Baltimore is the birth-place of dentistry. The star of our profession first shed its light and transcendent glory to the world from the city in which we are assembled to-night. Being upon our native soil in the "land of our fathers," nothing could be more appropriate than to take a retrospective view of the achievements accomplished, but time will not permit even a glance at the past. It will be enough to say that in the short space of fifty years den-

tistry has sent glad tidings to every nation upon the earth, and "where'er the sun doth his successive journeys run," we offer a "healing balm" to suffering humanity.

No influence has been so potent and so powerful in advancing our profession, and nothing has given us a greater impetus to place us upon the high plane upon which we are standing to-day, than dental associations. Our dental colleges have done a great work, and are primarily the natural starting place for the student, but our societies have been as a post-graduate course to the individual, and a *special* inspiration to the practitioner, where he meets his professional brother face to face, to engage in the higher spheres of professional attainments. The profession recognized the *truth* when urging dental colleges to extend their scholastic term three years, before granting diplomas to students, that our hope for the future must be in a higher educational standard. We are moving in an age of light and knowledge, an age in which science and art are marching onward, and whatever useful and engaging endowments we possess, we must wield with unflinching energy,—to stand still is to retrograde. What we can effect as a profession depends on what we are. If our work is small and narrow, we will have no force, no weight, no influence in the community. If we push onward and forward "still achieving still pursuing," our work will be massive, our influence cogent, the power of our profession will be felt as a "kingly spirit having authority."

The philosophical and energetic student will find in the realm of dentistry a field wide enough, and comprehensive enough, to engage the most liberal mind in the acquisition of knowledge and truth which alone creates a scientific spirit and comprehension of natural laws of order and of necessity. Of this necessity, dentistry was born, and thus brings us face to face with the ground work upon which our profession must ever stand; upon this basis the men of culture must build, and by patient application and

investigation they will be brought to perceive the unity of histology, anatomy and physiology; discover under biology, chemistry—under chemistry, physics—under physics, mechanics and mathematics. From the stand-point thus arrived at, the scientific dentist reasons, analyzes, compares, weighs and measures, and is thus brought to the logical phenomenon of cause and effect.

To simply affirm that a tooth has decayed, and that a gold filling inserted into the cavity will preserve it, will not satisfy an inquiring mind. The mind must have an ultimate fact upon which to repose. It inquires for the cause of the decay. It is not sufficient to tell it; that is a law of nature. This it regards as no cause, for law is only a mode of action, and is therefore of itself nothing. This may satisfy a school-boy for a time, but a philosophic mind regards the assignment of the cause as but a restatement of the phenomenon in question. It cannot regard the mere fact as the end of all philosophic inquiry, neither can it rest in an eternal succession of causes. It *demand*s a *first* cause; credulous ignorance would very probably accept the condition as presented as final, with no care or thought as to cause, but not so with the learned man—he *must* reason.

The mind sees material things exist, and it demands their origin and a recognitory basis for their being. So to return to the first proposition we will see by reflection as we already know by experience, that we are brought face to face with the powerful reality that "*knowledge is power*" and alone emancipates the reason, because it dissipates ignorance and superstitions of every kind, and teaches the *true*, the possible and the useful. In brief it is the only elevator of the professional mind, and only opens to the soul large horizons, capable of comprehending the scientific unity and ground work of all that is implied in the profession and practice of dentistry.

The Maryland State Dental Association is reminded there is yet a great work to be done to place the pro-

fession where it properly belongs. We have done very little in Maryland to add to the material interests and elevation of the profession at large. If we wish to join the march of fame, we must "be up and doing." "The profession calls for champions, and the fields are white unto the harvest." There is not one man in the society who has not the capacity to accomplish at least one useful and important worthy purpose, for the general advancement of dentistry. It will require *purpose, will* and *oneness* of aim, and invincible determination to meet all the demands, hopes, aims and prospects.

We invite the young men of Maryland to join the State Association and become identified with the profession. Young men and young workers are wanted. There are prizes enough for every earnest and faithful worker and crowns enough for every honorable *head* that is willing to go through the smoke of conflict to victory.

We say to the young men, there will be obstacles to be surmounted and difficulties to be vanquished, yet with truth and integrity for your watch-word, and leaning on your own noble purposes and indefatigable exertions, you will be honored by your profession, and be an ornament to your community.

Much has been said about the erection of monuments and memorials to the memory of Drs. Harris and Hayden and their faithful co-laborers, who devoted the best efforts of their lives to the profession of dentistry, in establishing the fundamental principles upon which we to-day stand. Their names are written imperishably upon the pages of dental history, and in view of the reverence and grateful remembrance of them, what more endearing and grateful memorial could be dedicated to their memory, than the Maryland State Dental Association, by infusing new life and energy, to make it the central attraction for the dental profession of this country. We would only be perpetuating the work so grandly begun by them.

We remind the association that at our last annual

meeting out of seven committees appointed by the President, only two submitted reports. When committees are appointed and called upon to render reports to the society, excuses, however plausible, avail nothing—neither can they be accepted. It should be considered a trust of honor, and faithfully performed. When committees fail to render reports the primary objects of the society are lost. The success of the society does not depend upon the President, but upon the united co-operation of each individual member.

In order to give this society additional strength and interest, it has been suggested that we invite the society of the District of Columbia to meet with us, and meet alternately in Baltimore and Washington. If such an arrangement could be effected amicably, much strength could be added to the annual meetings.

“Death loves a shining mark,” and since we last met the destroyer has had a rich harvest from our ranks. Many of our most distinguished brethren have been called hence, and it is hoped the Association will appoint a special committee to draft resolutions suitable to their memory, to be placed upon the records of the society.

DENTAL LEGISLATION.

BY H. B. NOBLE, D. D. S., OF WASHINGTON.

Thirty-nine states have dental laws. Most of them have been passed as they now stand, within the last half dozen years; many of them, we think, are not in accord with the best thought of the profession and will, like all young vines, need careful pruning and training, to produce the best and most desirable fruit.

Most of them give too much power to examining boards—a power they have not been slow to use before even their own fitness for the position had been tested or

proved. A seeming antagonism between state boards and colleges has appeared. That was unnatural, and if persisted in, will be hurtful to our dental colleges, which no thoughtful lover of dental education can approve.

The work of our dental colleges is the foundation upon which to build a scientific, capable dentist, and all action of state examining boards, or of dental legislation that tends directly or indirectly to bring into disrepute the diplomas of reputable dental colleges, or of college training and work is to be deplored.

College work and diplomas may not in all cases be what they should be; but will the discarding of diplomas by examining boards tend to more careful work in our colleges? We think not. If examinations are conducted, as in some of the states, making no distinction between the good and the poor, will it not be detrimental to dental colleges? Are the men on the examining boards as a rule qualified to sit in judgment on the college professor's work, or even to ascertain the knowledge imparted or possessed by the student, and understood by him? It requires training and practical experience to ascertain just what a student knows. The teacher by daily contact for months with a student can best determine what he knows or is capable of doing.

The state boards ought to visit the colleges in their states, and a representative at least be present at the examination in the dental colleges. There should be more; there must be harmony between examining boards and the colleges, or there will be trouble that will retard that growth of scientific education that every lover of his profession is looking and working for.

It is time for the profession to let its voice be heard in this matter when thirteen states: Alabama, Colorado, Florida, Georgia, Maine, Massachusetts, Minnesota, Mississippi, New Jersey, New Hampshire, North Carolina, South Carolina and Virginia, have laws that do not recognize a diploma from any college, but all must stand an exami-

nation. Such a man as my friend, Dr. John E. Rich, who acquired a reputation before most of the men on the examining boards were born, could not go to and begin practice in any of the states named until he had been examined by a board. Again, what man is there who ten years or five years after graduation could stand a technical examination? I am sure I could not, and there are few who could. Is it right, is it just, to the old practitioner to be obliged to take up his school boy studies, if perchance he should wish to change his residence?

I believe in making a diploma mean something. Encourage and build up our colleges, make the diploma as hard to get as you please, put the student through as severe and hard an examination as you can make; but when he has once passed such an examination, give him his diploma and take him by the hand as a member of the profession who has earned a right to practice his calling in any part of these United States; and when this is done, it will give him a standing in other countries that is now not recognized, and will not be until we have shown confidence in our own work.

It was the work of dental colleges that suggested dental legislation, and called into existence dental examining boards. They are the very off-spring of our colleges, and like an ungrateful son, scorn their advice or teaching, thinking themselves wiser than their parents. A little more age may tend to give them wisdom and lead them to a better understanding of their true position and relation to the dental profession.

We need laws, but they should be framed with due thoughtfulness for the elevation, as well as the protection of the profession, and we must try and get men on examining boards who will have the mental and moral calibre to see beyond their own surroundings and the magnifying of their own importance. The National Board of Examiners, and the National Board of Faculties, have both been productive of great good, but their future use-

fulness will be curtailed, if not destroyed, unless harmony and unison of action be maintained between them. Let such legislation be had as will be for the support and encouragement of thorough education of those who propose to practice our profession. By the rejection of all diplomas a reflection is cast upon the examinations of students in our colleges. Who is there to review the work of the examining boards? Are they not quite as likely to err or be biased in their judgment if the work be alone conducted by them? A few of the states require as a prerequisite for examination a diploma, thus distinctly setting the examining board above the college, which looks to me like making the father subject to the whims of the son. We believe in colleges and college work, but I fear we shall see a deterioration in their work if their diplomas are not recognized. In fact, will not the student ignore them altogether and gain his knowledge by private pupilage with some dentist, who for a consideration will undertake to prepare him *for*, and even guarantee him the certificate *of*, an examining board through a friend on the board?

Will not the members of the Maryland State Society give this subject their thought and attention, so that harmony of action between your state board and colleges may serve as an example to other states?

We have no dental law in the District of Columbia yet, but we are working for one. A bill has passed the Senate and been favorably reported by the House, and we hope before this session of Congress has passed to have it enacted into law, and the graduates of your colleges will only be required to register, when they will be made welcome to practice our noble calling.

DISCUSSION OF DR. NOBLE'S PAPER.

After reading his paper, Dr. Noble said: Since I came to this meeting I see that you have recognized some of the difficulties in dental legislation and that you are

taking steps for a new dental law in this state. The thing needs to be done in many of our states. I suppose you have read the paper by Dr. Sheppard of Boston. He is one of the State Examining Board for Massachusetts. He pledged himself as a member of the Massachusetts Board, to try to have the laws revised. But what we need is to have the general expression of the whole profession.

Dr. M. W. Foster.—The question of dental education and of harmony between the governing boards and faculties of the dental colleges is very important. How is it possible for a set of men, who are probably not always well fitted for their position, to decide justly? That these men should be entitled to say whether a graduate of any school in the country should be accepted or rejected is very discouraging to the dentists. There is certainly a chance that through political influence men will get on the governing boards of the states that are not just the proper men for the position. Therefore I can say that I am very glad Dr. Noble has taken the ground he has.

Dr. J. B. Rich.—Mr. President, it appears that this matter of examining boards is of vital importance to our profession. The manner in which governing boards are appointed is wrong in principle. The members of the board may be appointed through a good or a bad influence. Who can tell? A political influence is generally a bad influence. It seems to me to be an evil which calls for strong action at once. I think the members of this society ought to be agreed on this subject and, if they take the view which seems to me to be a plain common sense view, to act accordingly.

A member of the board of commissioners might be an inferior dentist, having secured his own appointment through improper influence, and yet he would have the right to say whether the graduates even of the best institution in the country shall have a right to practice in that city or not. I don't know but that it is really unconstitutional; that it is interfering with the rights of a citizen

of the United States. The Supreme Court is coming around to this position.

If the graduates of some dental colleges are not sufficiently well trained, these colleges need to be brought up to the standard so that their diplomas shall be sufficient.

I think that it is only by the action of state societies that this matter can be remedied. Therefore I think that it is the duty of this society to take the initiatory movement. As this is the state in which the first dental college was established, I think that this society could well take the initiative.

Dr. Noble said that in this state the Examining Board say whether a college from which a dentist may come is reputable or not.

Dr. Rich.—I think this is more disgraceful yet.

Dr. Mills.—I believe that any law such as the above is against the rights of the citizens of the United States. Suppose a man enters a college which has a charter from the state. Any man has a right to appeal from the decision in regard to his diploma, if it is not accepted, and I think his appeal would be sustained by the Supreme Court. I think if a man once holds a diploma, that should be his passport. If a college is not reputable, it should be turned down by the state in which it is.

Dr. Rich.—I must apologize for taking the time of the society again. I was one of the first to help try to raise the profession from the slough in which it was situated. We have gone on and increased the numbers and raised the standard of our profession. Those who have succeeded, those who were first, have found a much easier path, their profession being recognized as a valuable one and one which is necessary to the community. But I think they have forgotten their duty. It is their duty to see that this movement which was started by us should go on continually. It is the duty of every man in this room to see that the elevation of his profession goes on all the time, that it receives no halt such as we have now met

with. There should be some reorganization so that this examination should be done away with.

Dr. Noble.—Just one more thing. I believe that all the speakers have taken my side. I want here to call attention and emphasize the fact that this committee which you have appointed here will consider these things. I hope that they all will be carefully thought out and that the best legal talent will be employed in drawing up the bill to be presented to the Legislature.

THE CONSERVATION OF EYE-SIGHT IN DENTAL OPERATIONS.

BY L. ASHLEY FAUGHT, D. D. S., PHILADELPHIA.

Mr. President and Gentlemen :

In choosing to speak to you to-day upon the "Conservation of Eye-sight I have not the slightest intention of delivering before your learned body, either a lecture upon the anatomy of the eye or upon the properties of light. With each of these topics and with their relations I am sure you are all sufficiently familiar. My sole object is to tell you of a few things which my experience has taught me will help the dental operator to preserve good eye-sight through an indefinite number of years.

We all know that the practice of dentistry perhaps more than other callings requires the keenest vision and a protracted use of the eyes. That they should be preserved in a healthy condition, under such conditions exercise is of the utmost importance. The abuses to which the eyes of the dentist are subjected may quite properly be classified into two divisions; those which occur during the hours in which he is engaged in his professional calling; and those which may occur while engaged in other occupations.

The first essential to the conservation of eye-sight during operating is that the light used shall be good. The

meaning of this remark, if interpreted by an examination of what is accepted as good light, in the many dental offices situated as they are in such contrasting situations, is that derived from a window placed to command a more or less uninterrupted expanse of sky. Good light is however not essentially this, but is necessarily dependent upon fixed scientific principles. Its definition is not to be summed up in the wisdom of those who claim it to be plenty of light from a northern sky. To my mind the room chosen for operating should be lighted by a single aperture, for a complexity of light throws a complexity of shadows which will prove exceedingly trying to the eyes. This aperture should be so placed as to draw the light from as high a point as possible. Light derived from the lower half of an ordinary window, or from that portion of an aperture which is below an imaginary line placed a foot above the plane of the work is of little use and detrimental to the eyes. The light we work by comes from the strongest centre above, and all lower lights will prove cross-lights, conflicting with, rather than aiding true and healthful illumination. The light will be more even if the aperture be glazed by a single piece of glass, rather than by several panes.

The portions of sash supporting many pieces of glass make interruptions in light and throw shadows, and each separate pane too has a different power of refraction.

Whether the single aperture should face the north, south, east, or west, or any other point of the compass, is a question your essayist considers somewhat immaterial. The important factor in accepting any one of these facings is to remember that a *steady light of a definite uniform intensity* is what is desired; and if this exists not naturally, what is commanded must be moulded into this condition by suitable arrangements. It will fully repay each dentist to study to equalize his light; which will vary with the exposure, time of day, period of the year, serenity or obscurity of the sky, etc. This study each person must make

for himself after having reached certain conditions which will be common to all. A wavering light is worse than one in which the intensity is lowered. Too little light is apt to produce near sighted condition of the eyes. Too much is the fault into which the majority fall—it overstimulates the eyes. Beware of any light which passes through any material calculated to give it a change of color—such as calico, ground glass, etc.

The direction from which the light comes to the mouth of the patient is of great importance. It is universally agreed that for general art purposes that which comes from the left is best. Light from directly in front, pains the eye and inflicts an unconscious strain in the retina.

The less furniture in the operating room the better, and the walls should be finished in a neutral tint so that reflection in the operating room may be reduced to a minimum.

There can be no doubt in my mind of the efficacy of the use of a shade of black silk by the dentist, so that the pupil may be secured from interruption in its adjustment. The action of the eyes is perfect in proportion as their adjustment is perfect, and should be shaded from the intrusion of collateral rays.

The reported experience of others shows that the dentist should confine the use of his eyes during operating hours to natural light. Injury is sure to follow any attempt to prolong work by the use of artificial light. Some of my friends have tried the experiment, with the result that those who had not used glasses before were obliged to put them on, and those who wore them previously had to increase their magnifying power. These sad results occurring a few months after introducing the use of the stomatoscope into their offices.

If the patients are permitted to have the use of a hand mirror during operations, care is to be taken by the operator that they do not hold or place it in their laps, glass upwards. Invariably caution them to turn the back upwards, and save your eyes much irritation.

There is much else that I would like to say on this portion of my subject, but I always fear that I am bringing as it were coals to New Castle when I speak to professional men, so with your permission I will now make a few remarks upon the second division of the topic. The care of the eyes during the interval of office hours is quite necessary for it must be admitted to have a material effect in conserving them for dental operations.

The principle causes of injury during this period are from defective or excessive illumination, from excessive application, from unclean or impure air, from exposure to cold, from mechanical or chemical injury, from mental conditions, from unnatural conditions of the general system, and from want or misuse of spectacles. I do not intend to consider in detail all of these, but have mentioned them as leaders to the thoughts of others who may follow me in the discussion of my paper.

Care should be taken in passing from a dark to a brilliantly lighted place not to expose the eyes too suddenly. A similar strain is produced by the reflection from snow, and in Philadelphia from the enormous quantity of white marble and paint used in building construction.

The exposure of the eyes to bright sunlight on awakening in the morning has produced troublesome inflammation, and our beds should always be so placed that we may not sleep facing the morning sun unless the windows of the room are sufficiently covered by curtains.

Solar light is composed of different colors, which are ultimately resolvable into their primaries:—red, green and violet. These three are combined in the proportion of five parts of red, three of green, and eight of violet. The choice of an artificial light for reading should recognize this scientific statement.

Reading and working by two lights is to be depreciated. Sufficient illumination should be obtained from one, for with the two one portion of the retina is stimulated in excess of another.

Reading in direct sunlight, in the twilight, or in moving railway trains has laid the foundation of eye troubles for many people. .

The smoking of tobacco is hurtful to the eyes if indulged in in a close railway carriage or in a room full of other smokers. I would also suggest the use of a mouth piece by those who habitually use cigars as it will tend to remove the smoke that comes from the end of the cigar to a greater distance from the eyes. For the same reason the smoke inhaled should be blown from the mouth in voiding it.

Now, gentlemen, in conclusion permit me to suggest that every dentist owes it to himself and to his patients to consult his oculist at least twice in each year. These consultations are best conducted, say, in July and in October. They are seasons at the conclusion and at the commencement of his winter's work, and the results of one examination may correct the other. After the eyes have had the rest of the summer, the October examination may save the use of the glasses which the July examination may have indicated, and yet the July examination may show sufficient overstrain from the winter's work to need immediate relief or correction.

The condition of the eye-sight your essayist has often found to be a good barometer of the condition of his health, and this he believes to be true of many others, and attention to the eyes may direct repairs to the nervous system in general.

DISCUSSION.

Dr. C. C. Harris.—While I do not want to be conflicting, I will say that in my early years I took a course in medicine. I found, according to authorities, that after a certain age there was no danger of near-sightedness. According to these teachings, it becomes impossible for a person, with normal eye-sight, to become near-sighted after the age of 25 or 30 years.

Dr. B. Holly Smith.—I have been interested in the

paper read. On account of my eyes I have been obliged to have a person read to me after a hard day's work. The different things the essayist has suggested have been very valuable suggestions to me.

Dr. Harris.—I hope no one will think that I didn't properly appreciate the doctor's paper. I simply wanted to state a fact which was called to my attention. I appreciate the paper very much.

Dr. H. B. Noble.—I think such a paper ought not to pass without laying emphasis on the important things mentioned there. What the essayist has brought out in reference to the selection of our light is very important. A northern light is a steady light but it is certainly a weaker light. For some time I used a northern light, but I don't think it is the best now. The light, I think, should come from one window and should be as clear and distinct as possible. I have found that light from the lower sash is not desirable. It is brought out in the paper that we should not have anything in the room to reflect the light to our eyes.

What he said about consulting an oculist was a new idea to me. I think hereafter I will give this regular attention. I recognize that the eye, as the doctor said, is the thermometer of our regular health.

I certainly desire to thank the doctor for his paper. It is one which will do us all good I am sure.

Dr. R. B. Winder.—I did not hear the paper, but there are some things which are important. The abuse of students' eyes over microscopes is to be avoided. I have the opinion of some of the most distinguished oculists of this country upon this point. For this reason I have never advocated the use of microscopes in the dental colleges. The dentist's hands and eyes are very important to him, and must be preserved for the successful prosecution of his business.

Dr. J. B. Rich.—I don't know that any more important paper could be presented than this which emphasizes.

the care of the eyes. Any attempt to increase the power of the light is dangerous to the dentist. I once thought of inventing an apparatus for increasing the power of the light on dark days, but I came to the conclusion that this would be injurious.

I think south light is the best because of the variation in it.

I beg leave to differ from Dr. Winder on the use of the microscope. From my own experience and from the experience of others I don't think the eye is ever injured by the use of the microscope. I have been an expert microscopist for a long time, and I think you will find very few persons having as good eyes as I have, considering that I am 81 years old. I should be sorry to see the mass of my profession shut out from the use of the microscope.

Early in my professional life, when my eyes were strong, I adopted the practice of using glasses while performing my dental operations. Perhaps I owe my good eye-sight to this. Just as engravers need to assist their eye-sight in this way, so do dentists.

Dr. A. J. Volck.—I am fully in accord with what has just been said in regard to the use of the microscope. I think the dentists will one after another see the necessity of taking up the microscope, especially in the study of diseased teeth.

I am pretty old myself. I have worked pretty hard at my profession. Have worked at things which require very good eye-sight. When I have had to take up fine work I have used glasses. I have just as good eye-sight now as when I was ten years old. What we need to do is to take good care of ourselves, especially of our digestive organs.

Dr. Rich.—I mentioned the microscope to you dentists. A few hints to you who are studying with them: Be careful to use as low powers as you can in the work you have to do; use as low an illumination as possible; also try to procure Ranney's moderator which takes away the red

rays from the light. It is the red rays which are injurious to the eyes. Always use as white light as possible.

Dr. Winder.—In my remarks in regard to the microscope I was not speaking of men of especially strong constitution but of men in general. If a person here has as good eye-sight as when he was ten years old, I don't think the microscope or any thing else would injure his eyes. I was speaking of the ordinary person. I think Dr. Rich has been a man of the strongest constitution in every particular. I am speaking of the cases where the use of the microscope injures the eye, and I think in the case of the ordinary person it does injure it.

Dr. Rich.—In my remarks of course I did not mean the abuse of the microscope, but I mean that with the proper use of the microscope I have never known of a single instance where the eye has not been benefited.

Dr. Lewis Buffett.—I commenced the use of the microscope about 20 years ago. I began spending three hours twice a week and my eyes failed me. I had to stop. It is hard to say what is meant by the proper use of the microscope. Some persons can use the microscope day after day without any bad result. A proper use of the eye will strengthen it. The dentist who uses his eyes rightly will find them strengthened. But the proper use differs with the individual.

Dr. Bonwill.—This is a very important subject. I can only give my own experience. For a long time I have used my eyes severely, often working from seven o'clock in the morning until one o'clock the next morning, yet my eyes are in good condition. Recently I found that I needed weaker glasses than I had been using. A man can excessively use his eyes if he keeps the rest of his body in good condition.

There is an advantage in using double glasses. You can readily look at either near or distant objects. You don't really know that you have glasses on.

I have found that a combination of northern light with

- east and west lights has been best for me. I always stand with my back to the light. Another point is to wear a shade over your eyes. In taking care of your bodily health, place your stomach first of all. Take care of what you eat.

Dr. Faught.--My experience bears out what I said in regard to the physical condition influencing the eyes. What I have given in the paper I have given as a result of practical study upon my own eyes. The suggestion of keeping the back to the light is important.

Dr. Harris in his criticism fell into a little error which was natural. I did not say that too little light would produce near-sightedness. I said that it was apt to produce the *condition* of near-sightedness.

In regard to the microscope I would say that I have used it a great deal, and I heartily agree with what has been said in its favor. When working with it you want a minimum amount of light and the use of color glasses. With proper care we can use the microscope without detriment. Sometimes you may find one eye falling below the normal and then coming back again.

In regard to my eyes the oculist says that each year my eye-sight is improving.

Dr. Winder.—I don't want to be misunderstood. I don't condemn the use of the microscope. What I condemn is the indiscriminate use of the microscope in the dental colleges. The indiscriminate use of the microscope in the colleges, requiring the same amount of work from all, regardless of the strength of their eyes, is wrong.

ARTICLE II.

OPPOSITION TO A NEW DENTAL COLLEGE.

The movement for the establishment of a Dental Department of the University of Buffalo is meeting with determined opposition on the part of some members of the

profession, who declare that the whole scheme is "at least a generation behind the times," and would be laughed at by all advanced practitioners. The dental college plan is warmly defended by some of the ablest dentists of the city — men who are able to command large sums of money for their services as tutors of classes in our best dental colleges. The controversy is extremely interesting, and as the *Courier* presents both sides of the subject the reader may judge of its merits.

MEETING OF THE OPPOSITION.

A meeting of dental graduates of the city of Buffalo was held at the office of Dr. C. W. Stainton, No. 37 Court street. On motion of Dr. Stainton, Dr. S. Eschelman was called to the chair and Dr. W. A. Burrows chosen secretary.

The call for the meeting was read and the object stated by the president, who then called upon Dr. C. S. Butler to give a statement of the whole matter as far as he understood it. This was followed by a general discussion of the subject.

Dr. C. W. Stainton offered the following preamble and resolutions, which were unanimously adopted and signed by all present.

WHEREAS, Our attention has recently been directed to an announcement in the daily press of our city that the University of Buffalo has already taken steps to establish a dental department in connection with that college, and that certain measures have been adopted looking to that end which we believe to be prejudicial to the best interests of that time-honored institution, as well as to dental science and the good name of the dental profession in Western New York;

THEREFORE, Believing as we do that the graduates of our reputable dental schools should interest themselves in all educational matters pertaining to our profession, as being the natural guardians of its welfare and best qualified to judge of requirements and conditions connected there-

with; we, the alumni of the various dental colleges of our country, and residents of Buffalo, in convention assembled, do adopt the following resolutions, to wit:

Resolved, That while we fail to recognize the demand or necessary for a dental school in our city, we shall not approve or support in any manner such an undertaking unless it be founded upon correct principles, in the direction of a higher standard of education, entirely above reproach and creditable in every respect to all connected therewith.

Resolved, That we earnestly and respectfully request the Council of the University of Buffalo to reconsider its recent action in this matter at the earliest possible moment.

Resolved, That we express our unqualified disapprobation in reference to the granting of honorary degrees in dentistry, as instanced at the recent commencement exercises of the University of Buffalo, under any and all circumstances, as being in direct opposition to the spirit of the age, in conflict with the animus of our reputable dental schools, and antagonistic to the rulings and recommendations of the National Association of Dental Faculties.

Resolved, That a certified copy of these resolutions be transmitted to the Council of the University of Buffalo, be published also in the daily newspapers of our city, and be furnished for publication to the leading dental journals of the country.

W. V. Grove, D. D. S., Ohio College Dental Surgery, 1881.

Louis Meisburger, D. D. S., University of Pennsylvania, 1888.

S. Eschelman, D. D. S., L. D. S., Philadelphia Dental College, 1875.

J. A. Stackhouse, D. D. S., Philadelphia Dental College, 1891.

Richard Kessell, D. D. S., Chicago Dental College, 1888.

H. H. Boswell, D. D. S., University of Maryland, 1884.

L. W. Robinson, D. D. S., Philadelphia Dental College, 1883.

L. S. Lodge, D. D. S., Philadelphia Dental College, 1888.

C. W. Stainton, D. D. S., Pennsylvania Dental College, 1872.

George B. Scott, D. D. S., Pennsylvania Dental College, 1875.

Cyrus A. Allen, D. D. S., University of Pennsylvania, 1881.

H. R. McMichael, D. D. S., Philadelphia Dental College, 1888.

E. J. Hausle, D. D. S., Pennsylvania College Dental Surgery, 1888.

Charles S. Butler, D. D. S., Philadelphia Dental College, 1876.

W. A. Barrows, D. D. S., Philadelphia Dental College, 1871.

REASONS FOR THE OPPOSITION.

In an interview with Dr. Stainton after the adjournment of its meeting, many points additional to those contained in the above paper were elicited. Asked what were the principal motives which produced the above protest, he answered that there were several. "First," said he, "several years since the Niagara University tried to open a dental school in connection with their medical college here. The scheme was fully as advanced as this new attempt and even more so—but the opposition of the dentists was such that it was given up. At the principal meeting against it a resolution was adopted that hereafter no effort should be made to start a dental school unless it had the unqualified support of the dental profession here. The man who offered that resolution has been the principal factor in this new attempt and has violated entirely that agreement.

"There has been no respect paid to the wishes of the dentists here. They have not been consulted. Sometime in April, 1891, about a dozen of us dentists got together and the result of this meeting was the appointment of a committee of five to consider the matter and report at some future time.

"They have never reported. Three of the committee got disgusted and dropped out. The others have gone and organized a school without regard to the wishes of any one of their dental brethren except themselves. They have taken the chief positions and of course are complacent.

"Second, there is no general conviction that such a school is needed here or would be of benefit to the profession or to the University. There has been a craze to organize dental schools for some years past. Chicago has about 30 characted schools; many of them, of course, are yet only on paper. But it shows how the fever has spread. If not another dental school were started for 25 years it would be one of the best things that could happen for the cause of dental education. I know that not one of the men interested in the starting of this new dental school, nor one of the men whose names are attached to the above protest, have a dental student or have had one for years. To talk of the need of a school under this condition seems insincere.

"Third, the chief disapprobation felt, is because the school has been started by methods no longer tolerated in dental circles, and which will almost inevitably prevent its being a school of reputable character."

When asked to explain this latter assertion more fully Dr. Stainton said: "In August, 1884, the faculties of the various dental colleges in the United States associated together under the name of the "National Association of Dental Faculties." They lay down all rules as to admission of students to colleges, their length of pupilage, and the conditions of their graduates. Every dental college

and every dental department of any University must receive recognition by this body before its diplomas are received by the examining board of any State of the Union. Year by year this body of educators has been raising the status of dental graduation and examining more carefully the character of new dental schools.

"Among some of the abuses they laid hands on years since was the granting of honorary degrees. The National Board of State Examiners, an auxiliary body, had refused in 1883 to honor the diploma of any school guilty of granting honorary degrees. In 1889 the Baltimore Dental College, the oldest dental school in the world, asked leave of the National Association to grant the degree of D. D. S. honorably on a prominent practitioner, but the request was denied. In several instances colleges have been suspended for attempting to graduate students in less than the time prescribed.

"Yet here in Buffalo is an attempt to start a school by methods at least a generation behind the age. Only one of the announced faculty has received his dental diploma in the manner approved for years by our highest authority. The chief agitator received his D. D. S. without attending any dental college, and his two chief supporters have had the degree conferred upon them by the 'University of Buffalo,' which never conferred the degree before, and without any pretense of attending lecture. The thing is so ridiculous that it will be a laughing stock in every center of dental intelligence in the country. All dental colleges and all dental departments of universities must have one full scholastic year before they can make application to the executive committee of the National Association, and this application must be made 60 days before the annual meeting of the Association, which is in August of each year. If this executive committee report favorably on the application it lies over one year before it is acted on. So that this Buffalo school cannot receive any official standing before August, 1894. We feel very

confident that when the executive committee knows the facts in the case as it will know them, no such recognition can be had."

When inquiry was made as to the feeling for or against the school among the reputable practitioners of dentistry here, the Doctor answered by saying that no attempt had been made to canvass this matter except among graduates in actual practice, who have been graduates long enough to get them into the city association. The protest is signed by every such person except one—who is in the new faculty.

"The feeling is so determined on the part of the signers of the protest that marked copies of the *Courier* will be in the hands of every prominent dentist in this country, and in the hands of the dean of every dental college in the country in a few days."

THE COLLEGIANS' SIDE.

Dr. W. C. Barrett, the distinguished dental surgeon and a lecturer of the University, was visited at his home by a representative of the *Courier*, that the story of the proposed dental department might be heard from the standpoint of one who has interested himself in it. Dr. Barrett, who had lately returned from Chicago, where he was required to perform some arduous labors in lecturing before a class of students, was ill in bed, but kindly consented to grant an interview to his visitor "if his mission was important." Dr. Barrett said:

"For a good many years the University has been desirous of making its medical teaching complete. To do this requires four departments, medicine, pharmacy, dentistry, and veterinary medicine. The University has had two of these departments for some time, namely, medicine and pharmacy, but long before the establishment of the latter department the Council had taken steps to establish a dental school. Owing to various causes, such as lack of funds, want of harmony; and the absence of proper ac-

commodations in the University building, nothing had ever been accomplished. With the erection of the new University building, the medical faculty thought the time had come for the establishment of a dental department. The plans for the building were drawn, and included the necessary room, before the dentists were specially approached. Then the matter was laid before some of them and they were informed that if the dentists of Buffalo did not choose to take the responsibility, others would be called upon, for the Council was determined to complete the original plans. Consultations were held which finally resulted in calling a meeting of the principal dentists of the city. That meeting voted that it was expedient to open a dental department, and a committee of five was appointed with power to carry out the objects of the meeting. The committee met and held consultations, but the members could not agree upon a definite course of action, and finally referred the matter to a sub-committee of two. That sub-committee formulated a plan and submitted it to the members of the committee of five, who in general terms approved it.

"The first acknowledged step that was taken resulted in the development of an unexpected opposition. The sub-committee consulted with the medical faculty and has endeavored to be guided by their counsel. They realize the necessity for entire harmony of action among those who are to take an active part in the school, and therefore have called into their councils only such as they felt had the same ends and aims in view as themselves. They realize that dissension in their ranks would mean ruin in their undertaking. There was nothing to be made out of it, on the part of any one, for the work that was done must for a long time, at least, be without the hope of any compensation; and the money that they would necessarily expend must be for the benefit of the University, of the dental profession, and the city of Buffalo. The college, when organized, would belong to the University,

and its belongings must be vested in it, so there was no chance for any pecuniary return.

"But those engaged in the undertaking had a pride in the city of their residency, a love for their profession, and a desire to do something to build up institutions of learning. Therefore they were willing to expend their money and give their time and undertake the labor necessary for what they thought was for the best interests of all concerned.

"At the late commencement of the University four gentlemen were appointed by the Council as the governing board for the new department. They will associate with themselves such help as is needed, and if it cannot be found in Buffalo, it can easily be procured elsewhere. The department will be opened this fall, for they have pledged themselves to the University that this shall be done, and have received assurances of the hearty support, not only of the Council of the University, but of the other departments.

"At the late commencement the honorary degree of Doctor of Dental Surgery was conferred upon two dentists concerning whose standing there can be no question. One of these is the oldest practitioner in the city. He has been the State Censor for this district for 15 years or more and has been prominently identified with professional movements in the State. The other is a practitioner of acknowledged eminence and skill, a prominent dental society man, and a leader in all professional movements. Neither possessed the degree of the schools, for they had entered upon practice before the modern era of dental education had its inception. The University honored itself in conferring these degrees, for the degrees of the most of the oldest practitioners are honorary degrees. Twenty-five years ago there were not more than four or five dental colleges in existence in the world, but with the passage of the laws regulating dental practice a dental diploma has become a necessity for a practitioner.

"Of course it is a matter of regret that any opposition should have been aroused. None but perfectly legitimate means have been employed. The school will come up to the highest requirements of dental practice and will be made as perfect in its teaching and equipments as the abilities of those engaged will permit. It would seem that nothing could be done in Buffalo for the furtherance of general or professional interests without arousing opposition. Nothing has been attempted for the beautifying of the city or for the advancement of any public interest without arousing the ire of the obstructionists. Prof. Park, in a letter to one of these, expressed the truth in a nutshell when he said: 'If your objections are not well founded, as it seems to me is the case, it shows that you are too much like a great many of Buffalo's better citizens who have little or no pride in Buffalo institutions, and who are unwilling to do anything by which they may be built up or improved. I should be sorry to think that there is any one who does not want the University of Buffalo to advance and be in fact what it is in name.'

"It seems a pity that there should be any one who, if unwilling themselves to do anything to forward Buffalo's interests, should possess a desire to hinder others in so good a work. The School of Dentistry is an assured fact. The gentlemen connected with it propose to make of it all that it is possible for them to do. If their professional brethren choose to hinder the work, to embarrass their efforts, and to prevent the making of the school all that it otherwise might be, they can only deeply regret it. Their course is plain before them. They have pledged themselves to a distinct line of effort and they will carry it out to the very best of their ability.

ARTICLE III.

TREATING A DISEASED ANTRUM.

Discussion in the Chicago Dental Society.

Dr. T. W. Brophy urges the necessity of thorough antiseptic cleanliness from the beginning to the end, without which it is almost impossible to cure disease of the antrum. We often find bone septum in the antrum separating the cavity into various cavities. It is sometimes difficult to make a diagnosis and to treat these cases well without breaking down the bone septum which separates the cavity into different parts. For instance, an operator may diagnose, as he thinks, disease of the antrum either by the presence of serous fluid or pus in the antral cavity. He may open the cavity and find it apparently in a healthy condition, and yet everything indicates he has an abscess. Further exploration will develop this anatomical peculiarity which is overlooked, the presence of the bone septum separating the cavity into two or three parts. I have seen cases where there were as many as eight distinct cavities formed, where there were little cavities running out into the molar process, distinctly formed, and separated from each other, so that, if fluid formed in one, we might make several explorations before coming in contact with it.

Drainage tubes are not generally necessary. If a large opening be made, which is the proper thing to do, making it as large as possible so as to introduce even the end of the finger, such an operation would give good drainage generally. The drainage tube must be just right, it must be neither too long nor too short. How can we determine the proper length? If an operator takes a silver probe and bends its end so as to form a right angle, then introduce it into the antrum, he may hook it on the floor of the antrum, and by that means the distance between the

floor of the antrum and the masticating surfaces of the teeth, thus indicating the length of the tube. He may then take platina and make a tube the right length. He should make a band in the manner we would proceed to make a band for a crown, and fit it to the tooth in close proximity to the opening or antral tube.

He can then, with molding compound, take an impression of the tube, and the band around the tooth, being careful to hold the tube where it ought to be. In taking that impression he removes the tube and also the band from the tooth, and makes a plaster cast surrounding them. He takes the cast to the laboratory, puts platina between the tube and band, and solders the two together, after which he adjusts the tube to the antrum, cementing the band to the tooth. He can drain the cavity at the most dependent part, which is at its floor. He has thus continuous drainage, which is the essential feature of the treatment of antral disease. When the patient is taking his food, he may plug the end with a little stopper, and thus prevent the introduction of food into the antrum. After meals he takes out the plug and gets continuous drainage. It seems to me this opening might be plugged with gauze, wax or anything else. Wax is clean, and I would not hesitate to use it. It will not absorb anything. It is often convenient about the mouth where I want to secure a wide opening, and to aid nature in filling in the cavity at its base with granulations; as, for instance, where we have necrosis, or carious bone. After the removal of the diseased bone, the wax may be introduced when the cavity has been antiseptically cleansed, and, by shaving off a little of the wax, from time to time, the granulations will fill the cavity and the disease be cured.

Irrigation is essential; and after this, I think one of the most valuable means of successful treatment is to make use of insufflations of powders, and there is nothing that serves me better than powdered boracic acid. This is my favorite remedy in these cases. An application that is

especially desirable in all chronic inflammations of the mucous surface, attended with a low form of vitality and suppuration, is a solution of nitrate of silver in about one part to five thousand, enough to stimulate and bring about a healthy condition of the parts. Here we have a surface that is secreting pus. We first open the antrum and get rid of as much pus as we can by draining it, then we wash the cavity with some warm carbolized water, or any other weak solution, but do not use peroxide of hydrogen at first.

I saw a case, a day or two ago, where peroxide of hydrogen was injected in such a cavity as we are speaking about. The patient called on one of our practitioners, and he found what he supposed was a chronic abscess where a tooth had been extracted. He filled a rubber syringe with peroxide of hydrogen and carried it up into the socket of a bicuspid tooth, and let the fluid go. The patient told me that he thought he was going to lose his head. I said, "What do you mean?" "I really thought my head would burst." The peroxide of hydrogen entered the antral cavity which was half filled with pus, and you know what the result would be in such a case. The dentist did not observe the precaution of thoroughly irrigating the cavity with carbolized water or even warm water. He should have cleaned out the greater quantity of the pus, and then he could have made use of the peroxide of hydrogen and removed the little remnants on the mucous wall which the carbolized water would not remove. He would then have the cavity in shape to use boracic acid or whatever he wished. I would put boracic acid crystals in there and let them lie so as to get the prolonged action of the antiseptic. The crystals would dissolve slowly and would serve our purposes better than any fluid.

Usually, if we have teeth in these cases, I would make an opening large enough to secure drainage without a tube. I had an instance a little while ago in which there were no teeth; the gentleman who was treating the case

made a tube and put it in a rubber plate, and that was a perpetual inconvenience to the patient, the movement of the plate, which always occurs to some extent, kept by irritation of the surrounding tissues. I would do it in this way: I take a large bur—I have some made for the purpose about four or five times as large as the largest burs used for excavating the cavities in teeth—and make an opening as large as my finger. By this means I secure continuous drainage, and the antrum is soon cured. The tube fixed to the plate is objectionable, because it causes more irritation than the patient can endure. A patient may wear a plate without much trouble, and the secretions will find their way down and out. I do not think it is advisable ever to put a tube in a plate where the teeth are all out, as tubes thus attached are certain to produce much inflammation of the surrounding tissues.

Dr. Louis Ottoby.—If the fluid you have injected comes out from the opening through the nostrils, would that be a sufficient indication that the antrum has been injected?

Dr. Brophy.—Generally it would. The opening between the antrum and the nose is situated almost at the summit of the antrum near the orbital plate. If you succeed in carrying the fluid up gently, you can irrigate the antral cavity.

I use a large syringe for this purpose. The syringe I use holds about four ounces of fluid. One of the important points in irrigation of the antrum is to use a large quantity of fluid, keeping the stream constantly running and thus washing the cavity. If you keep the stream flowing gently, it irrigates the cavity thoroughly and rids it of the fluids that may be there. I have a friend who endeavors to treat these antral diseases, where the teeth are present, by breaking down the naso-antral wall. I think this practice is objectionable. I have seen instances where there were thick incrustations of the nasal mucus in the antrum, and the incrustations formed there will keep up

the inflammation and rather aggravate the condition. I would rather make the operation of Christopher Heath, which is also objectionable, that is to make an opening through the canine fossa. If we take a barrel, filled with fluid, put it on its end, and then take the plug out of the bung-hole, it will drain the barrels down as far as the bung-hole, but will not empty it. That is what occurs when we open the antrum at any other place than its base. Ninety per cent. of the cases of antral diseases are due to abscesses of the teeth, and, if we succeed in removing the pus which finds its way into the antrum from alveolar abscesses and keeping the cavity antiseptically clean, we can speedily cure the antral disease. The pus from alveolar abscesses, making its way into the antrum, establishes inflammation of the mucous membrane of the antrum; consequently disease of the antrum is a secondary condition. First we have abscess with all the preceding pathological changes, and then the antrum becomes involved to an extent which may lead to extensive caries, or necrosis of the bones which form the antral wall. Should the bones become diseased, treatment for the removal of the dead tissue must be employed.

I have been a close observer of the treatment of a friend of mine, who has a great many cases of diseases of the nose and air passages, and it seems to me that the mucus from the Schneiderian membrane accumulates in the cavity, and the method is, in my opinion, objectionable, because of the incrustations formed therein. I do not see how they can accomplish as perfect drainage by the means outlined as by the method I have mentioned—opening at the base. Let us consider for a moment the structure of the antrum. For instance, we have at about the position of the first molar the most dependent part. I am not an artist, consequently I cannot make a drawing which would illustrate what I desire. The cavity is in the form of a pyramid, with the base toward the nose and the apex toward the molar process, and then dropping down so as

to form something of a V-shape with the sharp angle of the V downward. You get that usually about the position of the first molar, and in cases where the teeth are responsible for the trouble, and owing to the fact that the first molars are the first to decay largely, in the greater per cent. of cases the molar is responsible for the antral disease, and therefore it is the one which we would naturally select to remove to secure the best drainage of the antral cavity. By removing the tooth, increasing the size of the opening of the roots, we can introduce a large tube and secure good drainage. I regard it as impossible to secure efficient drainage at the nasal orifice, or Schneiderian membrane. I regard the opening of the alveolar processes far more efficient than the nasal opening; besides, it gives the operator easier access to the antrum to treat it. It seems the use of warm air, after irrigating the cavity, would be advantageous before making use of powders. It has been my custom, where I am in doubt, to put the patient at night on the affected side, then direct him, if possible, to keep that position till morning, and suddenly turn to the healthy side. If the naso-antral opening be not closed, the fluid will be evacuated into the nasal passages, and it will pass into the pharynx when the fluid escapes, unless the patient leans his head forward. I can generally make a diagnosis by getting the patient to follow directions without the use of an exploring needle.

Dr. G. V. Clack.—I have listened to this with interest all the way. I have had considerable observation and experience in diseases of the antrum. Antral troubles are of three parts: First, the most frequent are those derived from tooth troubles; second, engorgements that come from irritations of the mucous membrane from cold, and various causes; third, tumors, or diseases that happen to be located in this region, but not growing on account of the anatomical forms here. I have seen all of these varieties, and, of course, they will assume great variety of form. The last case I examined proved to be epithelioma, not originating

within the antrum, however, but extending to the antrum. It was a rather singular case. It seems to have originated on the cheek and had penetrated the masseter muscle, causing ankylosis of the jaw; and it was on this account that I was called to see the case. There was sufficient contraction of the muscles to close the mouth permanently. I found a large opening in the antrum in about the position of the wisdom tooth.

I have a patient now with a tube in the antrum. I put that tube in for the purpose of closing the opening, not to keep it open. The granulations which occur about the end of the tube that do not pass fully through, will affect the closure. I do not want continuous, but rather periodical drainage in these cases. I want it closed all the time, except when it is under my immediate observation. If it is to be opened at all, I want to be there. I do not want saliva to enter the cavity at all. The mucous membrane of the antrum is always affected if we allow saliva to pass in. It is infected through the nasal opening sometimes, but less extensively and injuriously than by the saliva. It is possible to keep the mucous membrane of the antrum free from suppuration for any length of time, provided we do not allow saliva to enter. Irritation by the saliva constitutes a very radical objection to the opening from the mouth in the treatment of the antrum, and, if I could find another point otherwise as good, I should prefer to use it and avoid opening from the mouth. An opening from the nasal passage is better in some respects, though we, as dentists, might object to it. The mucous from the nostrils might give some trouble. It is perfectly justifiable for those who are skilled in the treatment of the nasal cavity to use this kind of an opening. During the day there would not be perfect drainage. I would not have continuous drainage, and it is easy to get drainage when you handle cases with this kind of an opening. When I introduce a tube I plug it, and open it only when I am handling the case. I find little difficulty in the

treatment of the antrum. I have had one or two, it is true, that did not do well; that is, pus would recur though they might seem well for a considerable time. But these have been rare.

I have one on hand where I removed a polypus from the antrum, which seems to have grown from a little spicula of necrosed bone, left after the removal of a tooth. To remove the polypus, it was necessary to make a large opening, so that I could introduce my finger into the antrum, and there is trouble in getting it to close. I do not like the idea of making a large opening, for I have several times had difficulty in getting it to close. We are sometimes obliged to make a plastic operation for its closure.

In this last mentioned, in which I removed a mass of semi-soft material, filling the antrum and producing a great deal of pressure, there was never any pus after the operation, and never any foul smell. After the removal of the growth or diseased part, I irrigated the antral cavity with a weak emulsion of the oil of cassia in warm water. It is not necessary really to have more than a solution to effect thorough disinfection. I use a single tube with a large bulb as a syringe, often using three or four bulbfuls in an irrigation. Then, after draining, close the opening from the mouth. If you have not a tube in place; you can use a wax plug. This medication acts kindly on mucous membranes, much more so than it does on the skin. It is not so liable to blister the mucous membrane as it is to blister the skin. If the oil of cassia is used too vigorously, it is an irritant; but not so much so as some of the articles mentioned, and it seems to me it is a much more effective antiseptic than anything else we have used in such positions. It is much more effective in such positions than bichloride of mercury. Some of our German friends have condemned the oil of cassia without giving it anything like a fair trial in actual work.

Dr. J. G. Reid.—I do not readily understand how saliva can enter the antrum on account of its situation, unless by capillary attraction.

Dr. Black.—When you have a hole into the antrum from the mouth, the saliva will enter through it. A patient may take water into his mouth and force it through the antrum and nostrils. Saliva will be forced in during the motions of mouth and tongue.

Dr. Brophy.—Mr. President, may I add a word to what I have said on the subject of drainage tubes? These fellows, called microbes, do not all swim, some of them fly. They are everywhere present. While I recognize the fact that saliva is one of the most active ferments that we have, I also recognize the fact that if we have continuous drainage, though the saliva should go into the antrum, which is doubtful, clinical history of these cases teaches us that they will soon get well if properly drained and antiseptically cleansed. The mouth is rarely, if ever, filled with saliva, the condition is different from filling the mouth with water, and using it as a pump to carry water into the antrum. The patient does not fill his mouth with saliva and then pump it into the antrum. If the saliva enters the antrum and we have continuous drainage, it would not do any harm. Ulcers of the mouth heal under the saliva; they heal under the tongue where saliva is always present. I am not prepared to accept the statement that the antrum must be kept free from saliva in order to get well. I am not prepared to say that we are to exclude it to hasten the cure. I have taken out the whole floor of the antrum on many occasions for the removal of tumors and diseased bone, and the saliva has not poisoned the freshly exposed surface, nor in any way retarded the process of repair. Only a week or two ago I opened both sides of the antrum, and there was very little inflammation. It healed up. The spaces which are sometimes open are made by the removal of necrosed bone, and they heal up without trouble in the presence of saliva. If you get an opening large enough, and get drainage, the saliva does no harm.

Dr. G. V. Black.—I am aware that the mucous mem-

brane heals under the saliva. I have removed the floor of the antrum and found no difficulty in the healing process, and you will not where there is a continual washing of the parts with the saliva; but it is where the saliva is cooped up so that it will lodge and decompose that you have trouble, unless you keep the parts clean with a good antiseptic.

Dr. Brophy.—The saliva is not cooped up in the antrum, because you have constant drainage.

Dr. Black.—You have a little drainage tube to drain the part, but the hole is small and the antrum is large, you will have fermentation taking place in the antrum. When you put saliva into the cavity of a pulpless tooth what do you have? He who treats abscessed teeth without keeping saliva out knows he will get suppuration.

Dr. Brophy.—When you use drainage you get a free flow of saliva.

Dr. Black.—You will find that it is where the saliva does not flow freely that decomposition occurs, and there is where you get the trouble. The partial septa and irregularities of the antrum which prevent free flow, have been sufficiently described. I see these cases suppurating month after month—suppurating every day. The saliva and other foreign substances do not belong here, and they cause inflammation in such places much more certainly than ordinary mucus from the nostrils. We know saliva injected into rabbits is poisonous, and generally kills them. We know when we put human saliva in the tissues or in the cavities where it does not belong we get into trouble. At the Chicago College of Dental Surgery the students cut their fingers and applied court-plaster, and had suppurating fingers. If they had put a little cassia water on the plaster they would have avoided that, but they licked the plaster. They poisoned themselves by their own saliva. At one time a great many of these cases occurred in that school, and the suppuration ceased when they used an antiseptic to wet their plaster.

Dr. J. G. Reid.—I would like to ask Dr. Black a question in regard to saliva. For instance, you have a dog, he cuts

himself or is injured in some way. What does he do? He will lay down and lick that sore from morning till night till it gets well.

Dr. Black.—Yes, he keeps licking at it all the time and by so doing prevents fermentation taking place. Suppuration is the breaking down of inflammatory products by the process of fermentation.

Dr. Brophy.—We have to take into consideration the clinical history of these diseases. A patient comes to us with antral disease which he needs to have attended to. We know the first thing is to get the cavity drained. After we have secured drainage, emptied the cavity of its fermenting contents, we irrigate it, and apply our medicaments. My position on this subject is just this: If you plug a cavity, as one or two of the gentlemen have advocated to-night, so as to be sure that it is closed, you generally find that when it is opened you have considerable quantity of pus escaping at that time, and that pus, I contend, retained within the cavity is a great detriment to the tissues. Pus retards the healing of the tissues more than the saliva which might possibly get in the antrum, and I do not believe that saliva is likely to get in the antrum, except the patient makes a special effort to get it there. For that reason, I have followed both methods of treatment, viz.: keeping it plugged and keeping it open, and I have found in following up the clinical history of the cases, we get better results, a more speedy cure, if we keep the cavity open so as to drain it continuously. We cannot get constant drainage for the reasons that have been stated. The patient is not upright more than two-thirds of his time; the other third he is asleep. The antrum would certainly get well sooner by having it open at the floor. Plugging of the cavity will hold the secretions which are really irritating the tissues. I consider it far better to keep it open, even if a little saliva does get into it. Saliva on the mucous membrane produces less irritation than pent-up or retained or decomposing pus. The antrum should be irrigated two or three times a day to get a speedy cure. If it is plugged, you should remove the plug three or four times a day. If you do not do this, the patients go over Sundays and holidays and cannot get to the operator to have it

treated. It is better to remove the pus than to have it in the antrum. The microbes are present there all the time from beginning to the end of treatment, and they will be there afterward. We have to keep in mind the fact that pus is forming and accumulating, and we must prevent it from remaining in contact with the diseased tissues, to restore the parts to health.—*Review.*

Editorial, Etc.

MARYLAND STATE DENTAL ASSOCIATION.—The Maryland State Dental Association, organized in 1883, held its ninth annual session in the St. James Hotel, Baltimore, May 9 and 10, 1892. Annual meetings have been held without interruption. In 1887 it had but seven members in good standing, but after that time interest in the organization increased, and upon its absorbing the State Odontological Society, a rival body, its membership numbered in 1889 about ninety dentists. The meeting in 1889 was conspicuous for the able papers read and for the harmony that prevailed in all the proceedings. The same may be said of the session just closed. Two business matters of especial interest to the profession at large were adopted; one, appointing a committee of eight members to convey to the Senators and Representatives of Maryland in Congress the protest of the dentists "against the action of the Census Bureau in classifying dentists as manufacturers", and the other the appointment of a committee of three to confer with a similar committee from the State Board of Dental Examiners, and draft a dental bill to be presented with their endorsement to the Legislature in 1894.

The Committee on Operative Dentistry noted some adverse criticism against the report of its predecessor in 1891, which "advocated so strongly the practice of extracting the sixth-year molar," and its report said that "the acceptance of the report, as a whole, caused a notice to appear subsequently

in the *Dental Cosmos* to the effect that the Association endorsed, among other recommendations, the extraction of the sixth-year molars." To avoid such a construction as to the papers read at the ninth session there is printed with the proceedings the resolution adopted December 6, 1889, to wit, "This Association is not responsible for the views of the authors of the papers published."

ANNUAL MEETING OF THE CHICAGO DENTAL SOCIETY:

At the annual meeting of the Chicago Dental Society, held Tuesday evening, April 5th, 1892, the following officers were elected for the ensuing year :

J. W. Wassall, president; Thos. L. Gilner, first vice-president; E. A. Royce, second vice-president; L. L. Davis, recording secretary; Geo. J. Dennis, corresponding secretary; E. D. Swain, treasurer; J. H. Smyzer, librarian; G. H. Cushing, E. Noyes, J. G. Reid, board of directors; A. H. Peck, B. D. Wikoff, D. M. Gallie, board of censors.

GEO. J. DENNIS, *Cor. Sec'y.*

THE WORLD'S COLUMBIAN EXPOSITION.—Send fifty cents to Bond & Co., 576 Rookery, Chicago, and you will receive, post paid, a four hundred page advance Guide to the Exposition, with elegant Engravings of the Grounds and Buildings, Portraits of its leading spirits, and a Map of the City of Chicago; all of the Rules governing the Exposition and Exhibition, and all information which can be given out in advance of its opening. Also, other Engravings and printed information will be sent you as published. It will be a very valuable Book and every person should secure a copy.

Monthly Summary.

MELTED GOLD FILLINGS.—For example, we will take a patient for whom three large gold fillings are to be inserted; it will take at least three sittings, often more. Prepare the cavities only at the first sitting, take an impression of them (wax is as good as the other materials), place your temporary filling of wax or gutta-percha, and dismiss your patient. The difference is, you intend to make a perfect filling for these three teeth in your laboratory at your leisure, independent of saliva. Mix enough plaster with fine plumbago to hold the plumbago together, and set; oil the wax impression as for an ordinary plaster cast. While you are preparing the gold, place your mold to dry on the oil stove; use 22, fine gold. The mold can be made of the plaster and plumbago alone, but small flasks in the form of the ordinary molding is better. The plaster molds should be tied together with a narrow band of tin, or stove-pipe iron. Your three molds ready, and placed in convenient position, melt your gold in a small crucible, and pour quickly; it will not do as well to have two fillings in one mold, as one or the other is likely to be imperfect. If the mold is well made, the filling requires but little trimming. You now have three fillings ready. When the patient makes her appearance, you feel no dread of saliva; the first filling is freed from the tooth, the cavity cleansed of wax particles; you try the fit of your gold filling, and trim so it will enter the cavity readily. Test the articulation, and trim accordingly. Everything being ready, a single napkin is all that will be needed. Mix your oxyphosphate thin, that it may adhere to the walls of the cavity and the metal. Line the cavity with it, using but little, though enough to be pressed out. When you press in your solid gold filling, there will remain just enough to fill the imperfect adaptation of the gold, and this is what is most needed. All the fine pits and lines of the cavity are filled. Owing to the nice fit of the gold, there is but little cement exposed around the walls of the cavity to be acted on by secretions, and the action is not the same, owing

to the presence of gold, which plays with zinc. It will endure as much as the tooth substance, unless too much is exposed, owing to a bad fit; in such a case, remove a little of the cement, and fill with foil, which is the work of but a few moments. In finishing the filling, do so from the center of the filling towards the surrounding walls, as it spreads the gold over the thin line of the cement. The antagonizing of the teeth will also spread the gold. Still there will be little danger of decomposition, as it is but a film, and preserves bone very well. Keep the tooth dry till the cement is well hardened. Whatever defect occurs to a filling of this kind is from the exterior. Three gold fillings are inserted at one setting, with but little trouble to your patient, and the satisfaction to the dentist that he has inserted solid gold filling that will stand the test of time. In incisors, bicuspid, or any of the front teeth where the cavity is arc-shaped and cutting edge is required, it will be safer to drill a small hole through that part of the filling where, when it comes in contact with the cavity of the tooth, a shallow hole can be drilled into the tooth of two or three threads that will not endanger it, or give the patient much pain; then tap the end of a gold wire the size of the hole in the filling, and screw it in gently. After the cement has hardened, cut it off and finish. Such a filling will stay, and stand to cut in molars. Where it would be deemed necessary, two screws can be inserted. Tin is as good as gold in some cases; it can be cast in the same manner, with little trouble, as it melts easily. The cavity of the tooth should be shaped so as to allow the impression to come out without drag on the wax. Time will be saved by this in the adjustment of the filling. Now we can place a solid gold filling in any tooth, in any part of the mouth, with less trouble, and a more permanent operation, than a small foil filling in the front teeth.—OLIVER MARTIN, in *Dominion Journal*.

ENGLISH ADVERTISING DENTISTS.—A law case, bearing on the subject of advertising as used by professional men, was practically closed in the Court of Appeal in London yester-

day. A dentist named Partridge, holding a diploma from the Royal College of Surgeons, Dublin, registered by the General Medical Council, set up a dental institution, supported by extensive advertising. The Dublin people thereupon canceled his diploma, and the Medical Council withdrew the registration, whereupon Mr. Partridge brought an action, which, though it did not get him back his diploma, had the effect of getting his name restored to the register. Now, this is a very vital part of the matter, because although the diploma itself being canceled, he could not call himself by the titles it conferred, he was still now again a registered dentist, and could recover his charges at law, if need be. All this took a long time, and, unfortunately for Mr. Partridge, the authorities with whom he was in conflict had another string to their bow. For one of the conditions attached to his diploma had been a promise not to advertise, and he had, in point of fact, spent upwards of \$50,000 in advertising. The Medical Council, taking advantage of this, again removed the name from the register, on the ground that Mr. Partridge's broken promise constituted "infamous conduct in a professional regard," and his action at law, by way of meeting this, has just been dismissed.

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It is interesting to note the legal subtlety of the decision. Mr. Partridge is not dubbed "infamous" for advertising only, but rather for advertising after he said he would not, but the Master of the Rolls took occasion to very strongly condemn advertising by professional men in any case. The learned professions will evidently have to get on without advertising; and perhaps it is just as well.—*Printer's Ink.*

DEATH IN THE OPERATING CHAIR.—In *Zahntechnische Reform* is an account of the recent death of the opera singer, Frau Brandt-Geortz, of the Imperial theater in Hanover, which occurred under tragic circumstances in Cassell. Frau Brandt arrived there from Hanover April 11th, to visit her husband and family. She had complained for some time of violent pain in the right upper jaw caused apparently by a

molar which was loose; there was also a fistulous opening on the gum. About midday she went to a dentist who was formerly well known to her, and who had frequently attended her, in order to have the tooth extracted. When Frau Brandt entered the room she was in such a very agitated condition, that as the dentist noticed also a marked increase of corpulence, he refused to undertake the extraction, especially as the patient wished for an anæsthetic. As she was, however, soon returning to Hanover, and wished to regain her health the dentist yielded. She took her seat in the chair but having complained of the disagreeable smell of the narcotic, requested the dentist to proceed with the extraction. This was successfully accomplished, but she must have suffered violent pain afterwards for she screamed loudly. The dentist succeeded in quieting her and handed her the usual glass of water to rinse out the mouth. She had hardly done so when the color of the face suddenly changed, and without uttering a sound sank back and died. Attempts to restore life by means of the electric current, ether injection and artificial respiration were kept up for three quarters of an hour but without avail. This would appear to be a case of syncope produced by mental emotion and the shock of extraction, with fatty degeneration of the heart. The patient was only 33 years of age.—*British Journal Dental Science*.

SINUS FROM AN ABSCESSSED TOOTH.—By A. H. Beers, M. D., D. D. S.—On March 5th, 1892, an old man aged eighty years came to consult me about a "running sore" on the left side of his face. There was a mass of indurated tissue about the angle of the jaw, extending back to the mastoid process. There were two recently healed openings near the centre of this mass, with threatening renewal of suppuration.

History of case :—

Had never had toothache in his life. Last September his face began to swell. His wife, who is a know-it-all creature, applied several linseed poultices, and proudly succeeded in bringing it to a "head" on his face. The old man had suffered

great agony from neuralgic pains since last fall. He compared them to the repeated jabbing of a pen-knife all over the left side of his face and scalp. He had some trouble from trismus a short time ago, but it has entirely disappeared. His physician had lanced his face once. He then went to Montreal and consulted a homœopathic quack, who assured him it was cancer, gave him some pills, and told him he would soon be all right. I examined his face thoroughly, and came to the conclusion that it was a sinus from an abscessed tooth.

I examined his teeth, and found that he had a remarkably good set of teeth for his age. I found the putrid remains of the left upper dens-sapientia with a cheesy-looking exudate from around its neck. The lower dens-sapientia had a putrescent pulp, and was slightly tender on pressure. I removed both the upper and lower teeth and gave him a few simple directions. The upper I extracted as the cause of the sinus, and the lower one for several reasons. Its uselessness, the presence of putrescent pulp, incipient pericementitis, and the probable occurrence of alveolar abscess. Living as he did twenty miles from any doctor, he was not likely to consult any one until it had pointed and burst on his face. I endeavored to convince his wife of her error in poulticing the face for alveolar abscess, and, I hope, with success.

I have since heard (two weeks later) that the old man has had great relief from the neuralgic pains.—*Dominion Dental Journal*.

PROSECUTIONS.—Many licentiates have an idea that the members of the Board of Examiners should fulfil the duty of spies and detectives. If there is a quack in any obscure corner of any county they expect some officer of the Board to be omniscient as well as omnipresent, while they are particularly anxious to be *incognita* themselves. Nevertheless, though it is no more the duty of members of the Board than of others to secure information of illegal practice, it has been a duty voluntarily assumed, and most of the prosecutions have been brought about by the action of such officials. In Quebec

Province, especially, has this been the case, for the simple reason that if they had not been instigated by members of the Board they would have been altogether ignored. Last month two more cases were brought before the police court; one offender was fined \$100 and costs, another \$26 and costs. One of the most sublime exhibitions of cheek is attempted by the latter offender, who has been twice fined. Though he has been drawing a regular salary as an employee in a commercial firm, pretending to be indentured to a licentiate at the same time, and not having passed more than a few months in the office, he has applied to the local legislature for a private bill to permit him to practice without license, fee or examination. Quack premiers and boodling politicians reflect their principles upon every class of society, but there is hope at last for Quebec, as Mercier is degraded and honest men have hold of the helm.—*Dominion Dental Journal*.

HOW TO PROCURE AN IMPRESSION OF THE MOUTH WHEN PATIENT IS INCLINED TO NAUSEA AND VOMITING.—By C. V. Snelgrove, L. D. S., Toronto.—Get your druggist to make you some lozenges with one-quarter grain of cocaine in each lozenge. Before taking impression allow patient to dissolve one of these lozenges in mouth and swallow the spittle. If one is not sufficient, give patient another lozenge, allowing time enough for the lozenge to dissolve slowly, and you will find you can take an impression with plaster of paris without any inconvenience to patient or yourself.

Local anæsthetic for extraction of teeth or pulps:

R Cocaine Hydrochlorate	-	-	-	grs. v.
Acid carbolic xtals	-	-	-	grs. iv.
Gum Camphor opt	-	-	-	grs. vi.
Glycerine pure	-	-	-	grs. xv.
95 per cent. spts vini Rect. Q. S.	ad			3 ii

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Hypodermic syringe. Inject one or two drops deeply into the gums on inner and outer side of the tooth, and apply over the gums around the tooth, also in cavity of tooth, a

piece of absorbent lint or cotton wet in the solution. Wait four or five minutes (by the watch) and the gums can be freely incised and tooth extracted with but little pain.—*Dominion Dental Journal*.

GOLD ALLOYS.—Prof. Roberts-Austen has drawn attention to the fact that the properties of gold are changed in a most remarkable manner by alloying it with small percentage of other metals, and he lately exhibited a new series of alloys of this metal with aluminum. One of these alloys, containing 20 per cent. of aluminum, forms an exception to the usual rule that the melting point of an alloy is lower than that of either of its constituents. This alloy has a fusing point above that of gold, the most infusible of its constituents. Curiously enough, the alloy with 10 per cent. of aluminum follows the ordinary rule. These alloys have the most brilliant colors. The 20 per cent. alloy is a brilliant ruby in tint, while those containing greater percentages of aluminum are purple in hue.—*Scientific American*.

A DIFFERENCE OF OPINION.—Dr. W. A. Johnston, M. D., D. D. S., says in *Review*: "The plan of heating a probe to dry out a pulp chamber is open to criticism. The probe to be of any service must be hot enough to have the same effect as a coagulating medicine and this we wish to avoid." He recommends Absolute Alcohol, and also air blasts, commencing with the cold air and increasing the temperature gradually, thus preventing coagulation by using hot air first. Dr. H. H. Silliman, another M. D., D. D. S., on the same subject and in the same journal says: "The Gilmer electric root dryer is the best thing I know for this purpose." He also says not to use alcohol because of its coagulating power. "Who shall decide?" when two such eminent men with equal number of degrees so radically antagonize each other.

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ARTICLE I.—ORIGINAL.

MARYLAND STATE DENTAL ASSOCIATION.

The annual session was held May 9 and 10, 1892, in St. James' Hotel, Baltimore; Cyrus M. Gingrich, D.D.S., President, in the chair; W. W. Dunbracco, D.D.S., Secretary.

(Continued from page 19.)

HOW WE TREAT AND FILL THE CANALS OF
ABSCESSED TEETH SUCCESSFULLY.

BY WM. A. MILLS, D. D. S.

Of all the ills to which human flesh is heir, one of the most painful, and the most difficult to be combated by the dental practitioner, is an abscessed tooth.

How often have the most sanguine seen their fondest hopes decay, when those whom they had dismissed as cured return like Hamlet's ghost to haunt them, after they had reared some elaborate golden superstructure above a smouldering volcano, the presence of which they little dreamed.

It has been customary in treating these cases to have the patient visit the office every other day for two or three weeks for medication before filling.

Much valuable time has been lost to the busy practitioner, who is oftentimes compelled to leave more remunerative and pleasant work to attend those who called for treatment.

Besides, we have been using medicines requiring delicate and cautious handling, the foul odors of which filled our offices and clothing, reminding the uninitiated very forcibly of the smells emanating from a soap-boiling or a fish-fertilizer factory.

Nothing in our practice for years gave us more worry than attempting to treat abscessed teeth; for uncertainty seemed to hang over us from the beginning to the end.

In our opinion, our failures were not caused by not following the course of treatment, laid down in text books, and by authorities in the profession, but were because the treatment was not the correct one to follow in all cases.

We are thoroughly confirmed in this opinion, for we have seen failures from the hands of those more skillful than our own.

Again and again have we been tempted to launch out into the deep waters of total extraction in all cases of abscessed teeth, for fear of the uncertainties of the hidden rock, upon which the reputation of many practitioners has been wrecked.

But being conscious we owed a duty to our patients to try at least to save their teeth, whether abscessed or not, we continued on, feeling our way through the darkness by what light we had, hoping, perchance, we might in the course of time find the harbor of success.

We can never forget the advice once given by an old practitioner to a young man, who had just begun practice. Said he, "Young man, if you wish to make a reputation and want to keep it, never, I say, never fill under any con-

ditions abscessed teeth. Pull them out. If you fill them, nine times out of ten you will fail to make a cure, and nine times out of ten, your patient will seek the advice of some other fellow; and the other fellow will call you a 'quack' for having tried to do your duty. He will make a fee, and you will lose your reputation and a patient. No, sir, young man, if teeth are abscessed, sooner than take any risk, pull them out every time."

This was rather hard on abscessed teeth, and harder still on the fellow who lost both patient and reputation. Who of us has not had a similar experience? for *we* more than once, in our earlier practice, felt the power of the unprincipled man who had neither respect for code of ethics or conscience, but only lived to prey upon the reputations of his professional brothers.

Some three years ago, after considerable experimenting with different remedial agents, we adopted a new system of treatment, the sheet anchor of which is listerine.

Since that time, so great has been our success that all fear of any evil consequences has passed away in the treatment of abscessed teeth, under any conditions, save where the tooth has not sufficient alveolus to support it.

To-day we have greater confidence in it than ever, as it has proven such a haven of rest from the many evils of the old system.

Excuse us, if we seem too sanguine upon the subject.

If we have had failures, we know nothing of them, but this we do know that with a few exceptions, we have kept trace of all cases treated, and our success has been beyond our most sanguine expectations.*

Our system is as follows: After opening the canal, or canals, in the tooth to be treated, as is customary in the

*Since writing the above, two cases have been brought to our notice which were failures—one was a case of endostosis (exostosis), the other was the deception on the part of the patient in not treating the tooth until three days before coming to the office. Result: tooth saved after faithful treatment.

treatment of abscessed teeth, we prescribe the following to be applied by the patient :

Listerine Pure (St. Louis Ph'l Co) - - 3 iiii

Sig. Saturate a pledget of cotton, and plug it loosely in the pulp chamber, and with another pledget rolled rather hard, force this in on the first pledget, and plug tight. Do this *night and morning* for two or three weeks, and let no food enter the cavity at any time.

If any swelling or soreness should follow within 24 hours, instruct patient to pack cotton loosely for two or three days.

The object of tightly plugging the cavity is to force the liquid through the canal to the seat of the disease. We try to impress upon the mind of the patient that successful treatment is not with us alone, but more on the part of the faithful carrying out of our instructions, and keeping the tooth thoroughly medicated; otherwise all our labor will come to nought.

If the abscess is an acute one, before prescribing the listerine, we give the following :

R

Tinct. Calendula - - - -
Aqua, - - - - - aa 3 ii
M

Sig. Bathe the gums freely and frequently.

After all soreness and swelling has subsided, the patient is given the listerine treatment.

One of the greatest advantages of listerine is that it is cleanly and non-poisonous, and can be used almost as freely as water.

When patient returns for final treatment, before proceeding to fill, we pass a nerve broach into the canal, but not through it, for fear of wounding the parts beyond the apex and creating a blood-clot. If on the withdrawal of the broach, we find a strong odor of listerine, we proceed to fill; but if we find the *slightest* trace of foulness, we dismiss the patient to continue treatment for another week,

with the hint that the instructions given have not been faithfully performed.

Before filling the canal, or canals, we use the following :

R Iodoformum Pulv. 3 ss.

Creosote Lignum, add q. s. ft. paste.

Sig. Place a small quantity of the paste in the opening of the canal, following it up with stiff oxy-phosphate of zinc, and filling the canals clear to the apex of the tooth.

In all cases, after filling and finishing the operation, paint the gums surrounding the tooth with tinct. iodine.

DISCUSSION OF DR. MILLS' REPORT.

Dr. W. S. Twilley.—I have experimented with this treatment considerably. The idea of listerine was suggested to me by Dr. Mills. I have found it very successful.

Dr. W. A. Mills.—Dr. Volck says that he has been very successful with it, except in one or two cases.

Dr. H. B. Noble.—It seems to me that if the patient put in the cotton that he would get more saliva than listerine in the roots of the tooth.

Dr. E. P. Keech.—Dr. Mills failed to go into the pathology of the abscess at all. He refers to a case which he had treated in this way. It had proved a failure and he found that the cause of the failure was because exostosis had taken place. But I never knew that it could take place upon a dead tooth. I have been practicing for quite a long time, and I am quite sure that exostosis cannot take place upon a tooth which has lost its vitality.

Now in regard to listerine. It is an antiseptic. It is a most valuable preparation for the mouth. But as far as the treatment of an abscess is concerned, there are many other materials that seem better adapted for this purpose. It is difficult to pass such things up the canal of the tooth, difficult to get them up to the apex. Sometimes after work-

ing for an hour, we do not succeed in getting the fluid clear to the apex of the tooth. Hence I argue that if the patient is allowed to apply the cotton saturated with listerine, the result will be a failure in nine cases out of ten. I would say to these young men that if you propose to experiment with the treatment, don't experiment with a tooth that you value."

Dr. W. S. Twilley.—I must confess that I differ from Dr. Keech. I have used listerine and one reason why I use it, is because it is so harmless and does such good work. I instruct the patient in applying the listerine to keep the tooth dry and having saturated a piece of cotton with the fluid to force it in with another pellet of cotton rolled hard. I know that the success that I have had in treating teeth in this manner warrants me in continuing with my treatment.

Dr. Cyrus M. Gingrich.—In the treatment of a dead tooth the primary thing is to cleanse the tooth and keep it dry. I think it is of no use to put anything into the tooth until all the dead matter has been removed. After the canal has been thoroughly cleansed and is then kept dry, I believe we have accomplished about all that can be done for it. Then we believe that the cavity must be hermetically sealed.

Dr. Mills.—When I read my paper I said: "After opening the canal and treating it in the usual manner." *Always* the first thing to do is to thoroughly clean it and remove all the dead matter. Gentlemen, I say to you, take some case and try it, and if it fails, then come out and report.

Dr. B. Myer.—In the treatment of an abscessed tooth you need to force the medicine through the abscess until it comes out on the outside. The tooth must not be filled until the abscess is burned out and new flesh has taken its place.

HEMORRHAGE AFTER EXTRACTION:

BY CHAS. C. HARRIS, M. D., D. D. S., CHAIRMAN EXECUTIVE COMMITTEE.

Gentlemen:

Fearing that some committee would fail to make a report, the President, Secretary and myself at a late hour decided to write a small article each and combine them as a substitute therefor.

We all extract teeth, and occasionally serious trouble arises from post-hemorrhage. We are too often the assisting cause of this annoyance through the practice of a *useless* and *thoughtless* system or habit of giving the patient a glass of water with which to wash out the mouth. This is surely unnecessary and if we stop to think, we are doing what should be carefully avoided; we are encouraging hemorrhage. What we aim at is the cessation of bleeding, and this is accomplished by the blood clotting. Now is it not plain that water washes away the blood—not permitting it to clot? Experience shows that the first clot is less easily disintegrated than secondary clots. It may be that the wound at first is healthy while later serum oozes from the surface and thus prevents the accumulating corpuscles from taking hold, or the surface having had sufficient time to take on inflammation the blood will coagulate with difficulty.

In case there is a number of teeth to extract or we should wish to be rid of the blood in our effort to reach roots of teeth then give the patient a glass of water *as hot as can be borne*. Hot water encourages blood-setting, and is universally used by surgeons during their operations. In case of obstinate hemorrhage, what is to be done? Anything and everything in preference to those much used and exceedingly objectionable agents—sub-sulphate of iron and per-sulphate of iron. So far as I know these

are the most objectionable of all styptics to be used in the mouth. Why? Because the clot formed by this agent is so readily disintegrated and will nearly always come away with "recurring hemorrhage." Recurring or secondary hemorrhage will almost universally occur when dealing with a smooth surface. The reason why it does not always recur when sub-sulphate is used by the dentist is no admirable quality of the agent itself, but because it is used in conjunction with a simple pellet of cotton. It is likely this cotton and not the sub-sulphate of iron that has given the desired result. The cotton would act far better alone. Sub-sulphate of iron is an exceedingly irritating medicine and always leaves an inflamed surface. No wound can heal by "first adhesion" after its use. I think the objectionable features of the sulphates of iron very likely due to the irritating influence of the sulphuric acid used in their preparation. Here let me say that the acid exists in sufficient strength to act deleteriously on tooth structure. Surgeons use it only where an inflammatory result is desired—where sloughing is sought—where adhesions are cut asunder—for example, where an operation is performed on the womb for contracted os. The dentist may use it where the fraenum is cut or adhesions of the cheek to the gums are severed. What must we use? A *non-irritating* astringent, one which experience proves a permanent styptic, one not likely to create inflammation, least likely followed with secondary hemorrhage most of all one that experience has proven.

Alum is one of the most efficient, chloride of zinc is very desirable and also nitrate of silver than which no agent is surer. I approve of using them in the order named. With these agents we need fear no after hemorrhage of the mouth, unless it be one of those rare cases we have read about in which the whole mouth surface "floods" from a wound in one part. In this case a plaster impression must prove most efficacious.

What if we are without a styptic—without so much

as a pellet of cotton? Then use nature's own and greatest agent, the finger. Put your finger (or better the patient's finger) over the tooth socket, and the bleeding ceases. Hold it securely in position and the blood cannot flow, the clot will become hard and effective.

I will cite a case. Mr. S. had a bicuspid tooth extracted about three p. m. Being a plethoric subject and a victim of malaria for many years and at this time incapacitated for work because of the frequency of his chills and only able to take exercise walks. The dentist cautioned him to come back in case of renewed hemorrhage. The bleeding was profuse at the time but soon ceased. On getting home it commenced to bleed slightly and after night became alarming, but he thought better not to disturb his dentist and sent to the nearest druggist for something to use. Everybody's agent, the sub-sulphate was sent and used with the most temporary effect. He bled all night and sent for me at 8 a. m. I called, asked him to get up and sit in a chair. This he tried to do but fell over in a faint. We lifted him to the bed. From his appearance and the great quantity of blood in all sorts of utensils I feared he would die. I found his mouth open from a large fibrinous clot, half as big as the fist. I inserted two fingers, withdrew the clot and washed out the socket thoroughly. Dipped a pellet of cotton in some chloride of zinc, then in some nitrate of silver and packed this into the cavity. In five minutes his spittal was as pure and clear as it ever was. I advised a little whiskey every few minutes and all the milk he could drink for a couple days. This was the last I saw of him for a year or more when he informed me that the bleeding had proven a God-send, as he rapidly grew strong and to this time has not had a recurring chill.

Within a couple of days a physician sent me a note by a colored man, stating that the bearer had a tooth extracted a few days before with continued hemorrhage, that he returned to the dentist without relief. Called on him

and had been under his treatment a couple of days. He had used internal remedies and the old agent, per-sulphate of iron on a pellet of cotton. Despairing he sent the man to me in so weakened a condition that he could walk with difficulty. I thoroughly washed out the socket, carefully packed a pellet of cotton saturated with chloride of zinc and nitrate of silver. Not another drop of blood was lost. He called the following day to report.

I often stop a bleeding of the gum between the teeth most effectually by springing with *hot* water.

On commencing the above I expected to touch on other topics, but have unwittingly said so much, I close by asking you to discard the sulphates of iron as a styptic.

ADDRESS OF DR. BONWILL.

Since dentistry has been associated with medicine, it has begun to make itself allied with kindred sciences. I will show that it has in it a germ of true science when we throw aside our prejudices.

The teeth themselves give us one of the best evidences whether evolution is true or not. This subject has interested me for 34 years. The drawings which I have here have taken me 28 years to produce. The application that I make of the principle that I have found is in fitting artificial teeth.

The equilateral triangle of the lower jaw no other being has, except man and the teeth which are made for that jaw are made according to a natural law that has no gradation. There is no change and there never has undergone any except a retrograde.

Commencing as I did, this work has been simply unfolding nature. Starting from the equilateral triangle and in making these drawings, I have proceeded step by step.

Evolution must be true or untrue. If it is true, then

we have the work of an impersonality. But if I can show you that which some other being has designed before me, I have unfolded the work of some other intelligence preceding; a personality to whose intellectual powers our own are allied.

Have the teeth been perpetuated? I had the pleasure of looking at the oldest man known. He was found 20 feet below the surface of the earth. He has been calculated to be over a million years old. I found in his jaw the same equilateral triangle. I have gone over some 4,000 cases individually and each presents the same thing. You find it in the embryo from the time it is taken from the womb.

Dr. Bonwill then went on to show by means of his carefully constructed diagrams how the human teeth in their size and shape all follow a certain definite law; a law which he had gradually traced out, starting with the principle of the equilateral triangle already referred to. He showed that the teeth of the apes, were constructed in accordance with a different law and that there could be no progression or gradation from the teeth of the ape to those of the human jaw. He also showed how perfectly the human teeth and those of all animals were adapted to their purpose and that a perfect jaw will always remain perfect.

In conclusion he said: "Evidently it is intelligence which has so well adapted the teeth to their uses. The teeth are fitted for their places in the jaw just as an architect would fit the blocks of marble for an arch. Do you suppose the teeth would stay in place unless they were properly fitted? Therefore ascribe to some Being the design. Animals also have jaws just as perfect as any being's. Their teeth were made to fit their needs. Look at the individuality of each tooth! Look at the laws of mastication! When I come to consider the different relations of the teeth, how well adapted they are to get the most use out of them, do I feel the least doubt in my mind

that they were designed for their purpose by a Being of intelligence? In the relations which the teeth bear to each other in their adaptation to their purpose you will find the same regularity which you give to your own work."

After the completion of his address Dr. Bonwill said that in a short time he would have a book out on the subject which would show in full all his investigations.

DISCUSSION OF DR. BONWILL'S ADDRESS.

Dr. J. B. Rich.—I don't see that we have anything which we can discuss here. As far as I am concerned this matter of development according to these principles is new to me, and I suppose it is to the rest of you. I haven't knowledge enough of the subject to discuss it.

Dr. H. B. Noble.—I am in the same condition as Dr. Rich. The subject is entirely new to me. I did not know that it had been brought down to such exactness. We have a chance to see whether there are not some laws which will make our business more interesting.

When Dr. Bonwill's book is out. I shall be glad to get it and study its principles. In a great many things in dentistry I think that I am only beginning to know what there is to know. I almost wish I were a young man again.

The study of all these laws will bring us not only profit and interest in itself, but all our work will be done with more satisfaction to ourselves.

Dr. Cockerille, of Washington.—Dr. Bonwill has demonstrated to us very clearly never to sacrifice those most important teeth in the mouth, the first molars. In this respect I think he has opened the eyes of most of us.

Dr. Bonwill.—One little thing I would call your attention to—one of the strongest points that the science of dentistry can make against evolution. If nature reproduces herself, from whence come the temporary teeth? At the age of twelve the temporary teeth are all gone. How are they reproduced?

Dr. Darwin cut his own throat. He said, "demonstrate how any organ can be formed except by gradual development and you overthrow my argument." You can answer him with the human teeth.

Dr. Martin.—I have been interested in a similar field. I believe that to Dr. Bonwill belongs the honor of lifting dentistry into the place of a true science. He brings us out a law and says he knows it is a true law. Is not this the way in the whole universe? Look at water, H_2O , something put together in different proportions. This occurs in the whole field of chemistry. Everything in chemistry is put together according to fixed and definite laws. This is just what Dr. Bonwill has shown us here. This is the work of mind. Take the bones. Professor F. T. Miles, in speaking of the head of the femur said: "It is built just for its purpose. It is the work of intelligence, like ours but much superior." So we see the human mouth built intelligently but by an intelligence of an infinitely higher order than ours. Dr. Bonwill has brought his branch of the subject of dentistry to a true science as we will find if we follow his work.

To be continued.

ARTICLE II.

ORAL HYGIENE.

BY J. W. WASSALL, M. D., D. D. S., CHICAGO, ILL.

A Plea for the Prevention of Dental Diseases by the Establishment of Proper Habits of Cleanliness.

All statistics of civilized communities prove a gradual amelioration and prolongation of human life.

Mr. George H. Knight, in an article published in the February number of the *Cosmopolitan*, makes the pertinent statement that for the decade ending 1860, A. D., the an-

nual death rate for New York city was 33.66 per thousand. For the semi-decade ending 1865 it had fallen to 31.33 and in the semi-decade ending 1890 to 25.54; the rate for 1890 being 24.58. This amounts to a saving in the city mentioned of 3,000 lives annually. These results are attributed to the advance of medical science and of state and personal hygiene.

The same writer has it that the average life in Great Britain is nine years longer than it was fifty years ago.

It was the knowledge of these or similar authentic statistics, no doubt, which led Dr. J. Y. Crawford, at the recent banquet given to the Executive Committee of the World's Columbia Dental Congress—rather too warmly, perhaps—to claim that modern dental science had exerted greater potency than all other causes in bringing about this felicitous result. No intelligent observer will deny that the great awakening of civilized men, particularly noticeable in the States, as to the importance of preserving the natural teeth, has in the last half century, been a perceptible influence in bringing about the increased longevity alluded to. The profession of dentistry then bears a more important relation to human progress and comfort than is usually admitted even by the profession itself. To realize the truth of this statement one has but to picture to himself the unequal odds in the struggle for life, of a community without services of conservative dentistry, say for four generations. In other words the proposition is tenable that a man with defective teeth is to that extent unfitted to fulfill the requirements of human life and activity.

Medical science, which, in its broadest sense includes the practice of dentistry, has two purposes—restoration of the abnormal to normal, and the prevention of the abnormal. We have to do tonight with the latter question, and the task to which I have set myself is to endeavor to bring out, in some small measure, the part to be played by prophylactic dentistry in the department of preventive medicine.

The scientific and modern practice of dentistry implies that along with the restorative measures applied by dental surgery to the correction of lesions of the teeth, must go the combative or preventive measures supplied by the observance of rules of oral hygiene.

Generally speaking, the whole range of pathological conditions to which the teeth are subject, may be classified under two heads:

1. Diseases affecting the crowns of the teeth.
2. Disease affecting the roots and socket. Except traumatic lesions, both these classes of disease are preventable by conscientiously following strict rules of hygiene. An attempt will be made later on to formulate these rules.

It requires no argument to persuade you of the truth of the hypothesis that "the disease known as dental caries will not occur except where the causal microbes are permitted to grow undisturbed upon the teeth." The rational conclusion is then, that if the teeth are not allowed to accumulate deposits upon either their exposed or protected surfaces, they will be exempt from caries. More broadly stated the proposition is:

Given the varying predispositions of different individuals to caries, which is governed by the laws of heredity and environment, the growth of micro-organisms in the mouth is in proportion to the amount of disturbance they suffer, or, rest and opportunity they enjoy. That is a recognized fact, and almost axiomatic, I believe.

Is the practice of dentists as followed in the daily routine of seeing patients consistent with these undisputed etiological facts? We all know it is not.

Plainly, then, one great step in the direction of the establishing of correct habits of cleansing the teeth in the general public is to be accomplished by reform of the dentist, making obligatory upon him the performance of his duty. Similarly, as public sentiment now requires a man to be a graduate of a reputable college before entering upon practice, so can it compel him to teach oral hygiene and require his patients to observe its rules.

For the purpose of convenience, allow me to place people in three classes with respect to the care they give their teeth: Let us say that a certain number of people—the figures do not pretend to be accurate—by assiduous, intelligent care and a natural tendency to cleanliness in the teeth themselves, have absolutely clean teeth from year to year; the proportion is very small indeed, say one per cent. A second class are just as anxious and spend as much time, or perhaps more, than class one, but their efforts are ineffective because misdirected and on account of unsuitable cleansing implements and materials. This class constitutes say nine per cent. All the others who give slovenly or no care, belong to class three, forming the largest proportion, namely, ninety per cent.

If we are justified in assuming that caries and pyorrhœa alveolaris, the two diseases most destructive to the teeth, only occur in the presence of foreign matter which is allowed to accumulate upon them, we next want to know how to prevent the accumulations.

My own belief is, that it is possible in most cases for the individual to keep the teeth absolutely free from all deposits and food debris. I have been led to this belief by the study of several cases which have been under my care and observation for some time past.

The following would be the way of dealing with a person belonging to Class II or III who make periodical visits to have the mouth put in order.

At the first appointment, examine the mouth as to the degree of cleanliness usual to the person, and make a note of the conditions in the record book for future reference. Catechize the person to ascertain what are the present habits as to the number of brushings per diem, dentifrices, floss, tooth-pick, etc. Make notes of each point. Then show to the person with mirror every part of the teeth which is unclean. The patient may apologetically, or even indignantly say that it is impossible to be more thorough than he is. It is not prudent to deny this at the time if

you wish to accomplish your purpose, unless to explain that you may be able to help him to be more successful. You must gain his good will and inspire the desire by giving arguments for ordinary (ordinary in its new sense) cleanliness and explaining its benefits.

It is now proper to scale and polish perfectly each tooth. The mirror should now be used again to show the patient the change. Now is your time to teach a lesson of the most forcible kind. Say to him, "it is quite possible for you, by your own efforts, to keep every tooth in your mouth absolutely clean." Make this statement positively and dogmatically. With the effrontery, if you please of a bichloride of gold doser promising his dupe a sure cure. The moral effect of such an assurance and the placing of the responsibility where it belongs will be very helpful.

The instructions in the daily care to be given the teeth should now be distinctly and carefully impressed upon the patient's mind. Printed directions for children might be useful but I have never tried them.

Now, you may say all this and more—some people will acquire the habit easily—others, never. It is your business to labor patiently to the right end.

At the next appointment, for a filling, perhaps, make inquiries to see that your instructions have been followed.

If they have not, in every detail, reassert the necessity for it, refreshing the patient's mind, and, in some cases, demonstrate with a brush the practicability of your statements. Be careful not to lay down more rules than can be followed.

This system of following up the matter as long as the appointment lasts, seeing to it that the patient's efforts are sustained and effective and that the habit is formed, are the most important and valuable services you can render in your capacity as a dentist.

The task is not a thankless one; your labor will invariably be highly appreciated, and as these patients come back to you from time to time, it will be one of the greatest

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Now, you may say all this and more—some people will acquire the habit easily—others, never. It is your business to labor patiently to the right end.

At the next appointment, for a filling, perhaps, make inquiries to see that your instructions have been followed.

If they have not, in every detail, reassert the necessity for it, refreshing the patient's mind, and, in some cases, demonstrate with a brush the practicability of your statements. Be careful not to lay down more rules than can be followed.

This system of following up the matter as long as the appointment lasts, seeing to it that the patient's efforts are sustained and effective and that the habit is formed, are the most important and valuable services you can render in your capacity as a dentist.

The task is not a thankless one; your labor will invariably be highly appreciated, and as these patients come back to you from time to time, it will be one of the greatest

satisfactions of your professional experience to be able to say, after the most conscientious examination with the most searching of fine explorers, that you find no decay—no pockets

Now as to rules: Of first importance, of course, is the use of the brush. Twice daily is sufficient—at night before retiring and in the morning. It is of the utmost advantage to have three brushes in use. This is imperatively required—*three brushes*. A brush will not do effective work unless it has time to dry out. The bristles will always be too soft if it is used more than once in twenty-four hours. More good is obtained by this than one would expect without trying. What is known to the dealers as "medium" grade of stiffness is the best. To the well kept mouth with all its parts and members in a healthy state, a good vigorous brushing with a moderately stiff brush is a pleasurable sensation. Three brushes in use at the same time will also give longer service than if bought consecutively.

The usual instructions as to vertical movements should be given. Special directions are necessary to make the patient reach all the accessible surface. Remember that few people do this. It becomes your duty to dispel the common delusion that the last molar and lingual surfaces cannot be brushed. Anyone can touch all these surfaces who will use his brain, and for a time watch himself during the process. The old slovenly or thoughtless habit is to be broken up and a new set of movements learned. Insist on thoroughness, and keep on insisting.

Dentifrices: Some form of powder is the only proper dentifrice and it should always be used whenever the brush is used.

A pound can or bottle from which the small bottle for present use may be replenished is indispensable in preventing a giving out of the supply and a consequent deposit of calculus by a few days' forgetfulness to go to the druggist. Aim to make the powder as agreeable as possible, especially for children.

Women and children can be induced to use floss silk or rubber bands for interdental spaces at least once a day. Men should be encouraged to use the tooth-pick.

Disinfectant and antiseptic washes are allowable and useful, but should not take the place of powder applied by brush at the stated intervals. As a rule I recommend it only in special cases. The best results are obtained by the simplest means faithfully employed. It is more than probable that the individual whom we have in hand will have anywhere from three to a dozen appointments for the other needed operations. Opportunities are thus afforded to assist in putting him on the right track. You have given him a good start—how shall he be watched?

One or two months later, by previous arrangement, he must be summoned to your office for inspection. Perhaps—yes usually—a little scolding and lecturing will be necessary to put him right. At suitable intervals he must be notified again and both of you will be delighted at the fine appearance and freedom from disease presented.

My own experience is that it is not a difficult matter to bring about this happy condition and one success pays for a score of failures.

RESUME.

A statement to the patient of the advantages and desirability of absolute cleanliness of the teeth.

Namely, that it affords immunity from caries of crown and loosening of tooth in socket.

Economy of time.

Economy of money.

Economy of pain, and preservation of natural teeth all through life.

A statement of the means to be employed to maintain absolute cleanliness of the teeth.

Establishment of habit.

Three brushes for daily use.

Thorough brushing of labial and lingual surfaces twice daily with powder.

Silk, rubber bands or pick.

Regular visitation by appointments for inspection and instruction.—*Dental Review.*

ARTICLE III.

THE RELATIVE VALUES OF NON-COHESIVE
AND COHESIVE GOLD.

I will preface my few remarks by a quotation from a familiar and popular author on dental practice in his remarks on the use of gold as a filling material.

I refer to Dr. J. Foster Flagg, where he says, "It is a work which can be best done by not more than one worker in a thousand; a work which can be well done by not more than one worker in a hundred; a work which is not reasonably well done by more than one worker in ten, and yet a work which is attempted in gold-working dentistry by nine workmen out of ten."

Happy is the one man in the thousand that can best insert a gold plug. To him these remarks are not addressed, but it is for the benefit of the remaining nine hundred and ninety-nine that this article is written.

As far as is known, with gold as first used, and down to a comparatively recent date, no attempt was made to take advantage of its cohesive properties. In fact, an effort was made by the manufacturers to produce a gold that was uniformly soft.

I think I am correct when I say that to Dr. Robert Arthur is due the credit of bringing prominently before the profession some of the advantages of cohesive over non-cohesive gold. Dr. Arthur published a small volume on the subject in the year 1856, which had at that time a

wide circulation, and did much to revolutionize dental practice, and since that time down to a very few years a fierce war has been waged between non cohesive and cohesive workers. Reams of paper and rivers of ink have been used, and the result has been that the conservative worker has selected the poor part from each side, the one class conceding that for restoring contour, cohesive was best, and the other that with frail walls and at the cervical margins non-cohesive gold could be forced into the interstices with less danger of fracture or mechanical disintegration of the margins of the cavity; and to-day many of the best workers use non-cohesive gold at the cervical walls and the body of the cavity, finishing the filling and restoring the contour with cohesive, making a combination that is at times very desirable.

I wish to state here that I do not refer to restoring broken corners or building down teeth, for here cohesive gold is the material that must be used, but do refer in a general way to all other classes and modifications with a few exceptions.

At the risk of being called egotistical, I will explain the plan that has given me the most satisfaction, and resulted in the fewest failures; and as no advice is valuable that is not based on experience, and as we profit most by our failures, let it be assumed at the beginning that I have had my share of failures, and belong to Dr. Flagg's nine hundred and ninety-nine.

For convenience, we will divide the cavities we find into :

1. Small ones the size of a pin's head and a little larger.
2. Those with corners or whole parts to be restored.
3. Proximal cavities in the anterior teeth.
4. Proximal cavities in the bicuspid and molars.
5. Cavities on the labial surfaces of incisors and cuspids, and the buccal surfaces of molars.

In the first and second classes, the almost uniform

results have been in favor of cohesive gold through the entire operation, and it is not my province at this time to enter into detail as to its manipulations. Each operator is presumed to have a plan that is peculiarly adapted to himself.

In the third class referred to, namely, those on the proximal surfaces of incisors and cuspids, the plan I have adopted (after separation) is to so shape the cavity so as to have an undercut at both extremities of it; beveling both lingual and labial edges, not depending on the last two for the retention of the plug to be inserted. After the cavity is prepared, I take the proper size piece of No. 4 soft foil, and fold it into a ribbon that is one-third wider than the long diameter of the cavity; then take a small instrument, say a broken excavator, and roll into a cylinder (do not roll too closely). Experience will tell you how much gold you will require for the cylinder. It will vary from one-fifth to a whole sheet. (I prefer these cylinders to any found in the depots.)

It is presumed the dam is applied. You will then insert the cylinder into the cavity, forcing it up at the cervical margin, and allow it to protrude both at the cervical and lingual margins, forcing it into the undercuts at each end of the cavity, making a sort of basket of gold in your cavity; then begin with cohesive gold at the cervical, and finish the cavity with it, and at the last condense the whole with foot-shaped pluggers and finish in the usual way.

In the fourth class, *viz.*, proximals between bicuspid and molars, if the grinding surface is not weakened or gone, I pursue the same plan as in the incisors; but, if a compound cavity, I depend for retention on the lateral walls as well as the cervical, inserting the cylinders with the end looking toward the adjoining tooth, letting it protrude, making my basket as usual, and finishing with cohesive gold, condensing thoroughly wherever the soft gold came to the surface, and finishing with disks and tape.

In the fifth and last class referred to, those on the labial surfaces of incisors and cuspids, and on the buccal surfaces of molars, it has been my practice to bevel the edges as far as practicable throughout the whole margin, making an undercut all the way around with wheel-shaped burs, and inserting a cylinder on end, one that would protrude from a third to half its length beyond the cavity, and then make a cavity in the cylinder, forcing the soft gold into the undercut and filling the cavity thus formed with cohesive foil, and at last condensing the whole with foot-shaped points (as it were to head down a rivet) finishing with stones, etc.

One danger to the beginner in this method, is that the cylinders will not be of a proper size. They will either be too large to be inserted, or so small they will not be retained in place.

The one great object to be attained in any filling, except the restoration of contour, is to perfectly adapt the gold to the margins of the cavity; and there is no one that will attempt to gainsay the fact that the softer the gold the more easily it can be adapted to the walls and edges, and after the filling is inserted, the protruding ends of the cylinder can be malleted or burnished down with far less danger to the edges of the cavity. No operation is stronger than its weakest part, and generally the danger line is at the cervical border. In fillings inserted wholly of cohesive gold the trouble is not in regard to their coming out, but of not making a perfect and tight joint at the cervical and lingual borders.

All fillings are in a measure like a rivet, and there can be no better comparison than that all iron-workers use a rivet of as soft iron as is possible, consistent with the strength required. A steel rivet, though much stronger, does not adapt itself nearly as easily and well as one of soft iron; and, as one writer on cohesive and non-cohesive gold expresses himself in regard to burnishing cohesive gold to adapt it to the borders of the cavity, "one might as well try to burnish down a piece of cast iron.— *I. C. Curtis in Dental Cosmos.*

ARTICLE IV.

ARTICULATION OF THE TEETH.

An abstract of a paper by Dr. Isaac B. Davenport, Paris.

The old man who had lost all but two of his teeth and thanked God that those met, had some conception of the value of articulation. Many people with the mouth half full of teeth could not thank God for more masticating surface than this old man had, because their teeth strike together so badly that only a few are capable of mastication. The fact that such are often pretty healthy people does not prove that a very limited masticating surface is not deleterious. I believe the perfect articulation of the teeth is that towards which our operations should be directed.

I have no patience for the dentists who go chopping about the mouth like a bushwacker.

In trying to discover that form of articulation most favorable to its greatest usefulness, permanence and regularity, it became evident that some other method was needed than observation in the mouth, where only the outside of the teeth could be seen in contact, or with whole models from which only an imperfect idea of the inside striking of the teeth could be had.

To overcome some of these difficulties we have devised an articulator with triple hinge, which opens laterally as well as vertically.

Mere antagonism seems to express the prevalent idea of articulation; but antagonism is just what is most objectionable in an articulation. Teeth antagonize when they strike only here and there and prevent the other surfaces from touching. When thus arranged they may punch the food, but they cannot chew it. On the other hand, a correct articulation of the teeth secures their very highest

masticatory functions. In other words, a perfect articulation is the harmonious adjustment to each other of two most beautifully complicated, uneven, triturating surfaces in such a way as to permit all the movements of mastication, each prominence or depression having special reference to the normal movements of mastication, and to change their form or direction would be to render such movements impossible.

When thus perfectly arranged the masticating surfaces slide on and into each other, constituting a self-sharpening machine, made up of a complicated system of inclines, so balanced and bound together as to be practically permanent.

The forces being thus widely distributed, wear goes on slowly on all the surfaces alike, and the physiological process of pulp protection is seldom overtaken by exposure of sensitive fibrils, as is often when but little masticating surface can be employed.

I was formally under the impression that perfectly articulating teeth would finally wear flat, owing to the shortening of the bite, and the under jaw coming forward, the ends of the incisors and the cusps thus disappearing coincidentally; but the perfect adaptation to its function may tend towards the preservation of an organ.

A good articulation is where the arches combine most of the desirable qualities, such as continuous grinding surfaces, good contact for the most part inside and out, extensive contact possible on many planes without interfering with individual prominence; slight overshutting of upper incisors permitting the cutting movement without throwing the back teeth too far out of relation; the lower incisors capable of moving backward on the posterior inclines of the upper incisors, just sufficiently to conduct the cusps of the back teeth into their normal depressions with the same sliding contact. The rotary motion is permitted without the normal extent of contact being disturbed, either by too long cuspids or by such malposition

of the teeth as to entangle the cusps, for when a cusp by a false contact interferes, being out of relation with the rest of the surfaces, the movement is either arrested, or if continued, the effect of the rotation is destroyed because one cusp must raise over the other, and that separates the other surfaces.

To resume, we find in a good articulation the arches mutually supporting and tending neither to irregularity, contraction, spreading, separation, anterior projection, nor flattening; wear evenly distributed, and consequently slow.

I have heretofore endeavored to show how the closed teeth should form one continuous self-supporting arch, "each jaw being," as Dr. Dwinelle once aptly remarked during the discussion of this subject, "a perfect matrix for the other;" yet in conversation with many eminent dentists since that paper appeared, I have not found one who grasped the idea of the cross or binding articulation of the teeth, especially the bicuspid.

The normally arranged human teeth should touch all around in both arches.

To be well articulated the teeth must be regularly placed and correctly inclined.

The most common irregularity of the teeth is the irregularity of the position of the masticating surfaces, yet little attention is given this in works on irregularities, the attention being mostly confined to the deviations of the external curves or alignment of the teeth; yet if the former were attended to, the latter would necessarily be corrected, and more permanently than is usual with ordinary methods.

When teeth are regular and well articulated, they remain so because the forces and resistances are evenly balanced.

On the other hand, as the articulation is made up of a series of perfectly balanced inclines, it follows that when anything removes one surface, whether an extraction, decay, operation, or badly-constructed regulating or other

apparatus, improper force falls on other inclines changing the position of the teeth.

A few years after the teeth had been extracted, I have hardly ever found what I could call a good articulation, and the same is true when the teeth have been cut away between, or when the cusps had been carelessly removed while finishing fillings in the grinding surfaces. Such teeth antagonize but do not articulate, and cusps strike cusps, point to point, instead of passing between each other like cogs; and the motions of mastication are interfered with, especially the rotary, which is the essentially grinding motion, and hence the rapid wear of the limited number of antagonizing points goes on.

Largely on account of bad articulation, irregular teeth tend to become more irregular. Growth may improve some, but so far as a bad articulation goes, it is always unfavorable to regularity.

Much harm is done by the use of regulating appliances which change the articulation without improving it, and it is almost a universal fact that, unless an improvement can be made in an articulation, there will be no permanent improvement of the irregularity. The articulation is the only permanent retainer to be depended on. For the teeth will move till they find the best contact that circumstances can offer, and that movement often never ceases, because the forces never find equilibrium.

Before disturbing the articulation of a fixed irregularity, it is best to consider whether such disturbance can be overcome, and the articulation again made as good; if not, the chances are that the result will be worse than the original condition, and for the ultimate result we must wait not only "till the teeth become firm," as we say, but till they cease to move.

There is much yet to learn in regard to the meaning of the elevations, depressions, overshutting, shelving, interlocking, binding, curves, and inclines of the articulation, in their relation to biting, cutting, tearing, crushing and grinding movements of mastication.

In the treatment we may hope that at least articulations are not worse by our operations than when brought to us.

I will renew my indorsement, made before the International Dental Congress at Paris, of the use of Dr. Bonwill's articulator for the arrangement of artificial teeth.—
Items of Interest.

ARTICLE V.

FITTING A CAP OR A BAND TO A ROOT.

Dr. Charles J. Essig: The operation of fitting a cap or a ring to a root is very difficult. I have seen several roots that have been removed after bridges or crowns have been fastened to them, and I have rarely seen one where there has been precision in fitting the band. The form of the root is often very tapering, and in fitting a band under the gum we are apt to fail, through difficulty in determining its exact form, to obtain a perfect adaptation of the ferrule to the root. Where I have had the chance to prepare a root to my own liking, I spare as much of the tooth as possible, and do not go very far beyond the margin of the gum. Suppose we have a central tooth which is discolored or broken to such an extent that we find it necessary to crown it. How shall we prepare that root? Shall we cut it off in its entire circumference to the margin of the gum? I should cut the root off so as to save as much as possible of the lingual portion and beveling to a little above the margin of the gum on the outer or labial portion, so that the porcelain face may be carried under the gum to conceal the line of union. No gold should be visible in front. The cap I prefer is a partial cap.

There is another important point, the manner of

measuring the root and fitting the cap. It seems to me that a plaster model would be much better to depend on than a piece of wood which is made hap-hazard, or a piece of wire fitted to the root. Measuring by wire coiled around the root is largely employed, but has never been satisfactory to me. After we have gotten such a model as plaster will give us, we certainly have a pretty good facsimile of our case from which we may obtain very reliable measurement. The next step is to cut away the plaster model below the margin of the gum; so as to allow you to fit the cap. This model will be found to be pretty nearly like the root. If it is made of good plaster and thoroughly dried, then well saturated with thin sandaric varnish, and allowed to dry again, you will have a model that is hard enough to work on without injury; but precision in fitting the cap can, in many cases, only be obtained by fitting the band as well as you can, on your model; soldering it together, or making the ring first before you put the floor on, and then fitting it on the root itself. Force it up into the position that you want it in, and then see how it fits. Of course, it is well at the very beginning to make some preliminary preparation of the root. If you can determine that the edge of the root which is out of the gum has a decidedly tapering form, this must be remedied before taking the impression.

There must be precision in fitting the cap and pin together. Without the cap, the pin sustains all the force. The force of mastication is thrown on the long axis of the tooth instead of on the socket, where it properly belongs, and there is danger of fracture of the root of the tooth; we have all doubtless met with such accidents. If the cap does not fit the root well, it is no reinforcement to the pin; so it becomes necessary, to make one serve the other, to have the cap fit accurately. Much of the work of preparing crowns may be done by the mechanical dentist, and this is a saving to both operator and patient. I do not like to make a laboratory of my office, and a method

of procedure which obliges a dentist to go from the work-bench to the mouth of the patient will prove wearing and distasteful to both. The plaster model, on which most of the work can be accomplished, will save much time to the dentist and annoyance to the patient.

After the ring or ferrule has been so made, however, it may then be adjusted to the natural root. When the cap is fitted on the root, if it stands away from the sides, it can be burnished back; it cannot be adjusted to the root accurately at any other time. Then you can finish putting the floor on, and the cap is then ready for the reception of the tooth; but it would be better to try it once more in the mouth. Dr. Case remarked about the accuracy of the adjustment of the pin. The correct relation of the pin and cap is important. If the pin fits well and the cap stands away from the root, it will give no additional strength to the pin, and, when the force is thrown on it, it may bend or break, or the root may split.

I have found pure gold too ductile, so that even after we have fitted a cap to a tooth, with the object of making it reinforce the pin, it is quite possible that we may have a yielding of the soft gold. I much prefer one of the alloys of gold. Coin or standard gold affords greater strength and better results. Coin gold is very much stronger; it has a tendency of 70 or 80, while pure gold has only about 20 or 25, and I therefore favor the use of coin gold. By taking proper precaution and giving every detail of the operation proper care, we can get a sufficient adjustment, without depending on the burnisher to make the cap fit the root.

Dr. F. Van Woert: It is very strange, nevertheless a fact, that bicuspid and molars take kindly to bands or ferrules, while the incisors and cuspids are the reverse, especially centrals. Therefore I never use a band crown on these teeth, unless absolutely necessary. The only possible advantage of a band is to add strength to the crown and root, or, in other words, protect the root from

fracture. This same object may be accomplished in a different manner without encroaching on the pericemental membrane, as follows :

In the preparation of a root, the face should be cut on a straight line from the center to the gum-margin on the labial surface, forming an incline; and from the center to palatal gum-margin, forming a quarter-circle. Then drill, and fit the dowel into the root; after which bend a piece of pure gold the shape of the root as nearly as possible; trim to something like the contour of the circumference, after which place it on the end of the root, and drive the pin through it and to place. Now remove the whole, solder, and adjust, when the plate can be perfectly adapted to the ends of the root by a small pine stick and a gold plugging mallet. Now, by removing, you will find the outside margins of the root clearly defined on the under side of the plate, permitting you to follow accurately with the corundum wheel the exact shape of the root. After soldering the face to this floor, you have a crown possessing all the advantages of a band crown, and the great merit of not encroaching on the pericemental membrane.

I am surprised to learn that there are members of our profession who so enjoy labor that they attempt to finish bands after a crown has been set. They certainly cannot believe it possible to finish a band in this manner, anything like perfectly; in fact, I have great doubts as to whether it is possible to half accomplish this feat without permanent injury to the root. By all means, finish the band before setting the crown.

Roots should be conically shaped, so that when a band is driven on it will stretch to a close union at the edge. There are frequently small inequalities which it is better to burnish the band to than to attempt to cut away; but it is less difficult to burnish to one or two small defects of this kind than it is to the whole circumference of the root.

I do not believe it is better to work from a model. I

prefer the natural root. As to the instruments used for trimming roots, I have never been able to secure one that would accomplish what corundum wheels and emery-paper discs will do. I prefer them to any steel instrument that I have ever seen.

This principle of crowning preserves very much more of the tooth-substance than any other I know of. The principle of the V and half-circle, or a combination of both, in the preparation of a root to receive a crown, is an old one; but I consider it one of the best. I am opposed to the least sacrifice of tooth-substance where it can possibly be saved.

Respecting banding crowns, I have cut off the crowns of a badly-decayed superior left first bicuspid, shaped the root conically, finished and adjusted the band, applied the rubber-dam, filled the roots, and inserted a porcelain tip; the entire operation consuming thirty-eight minutes. The complication of any operation lessens the chance of its final success, and certainly adds very much to the discomfort of the patient and operator, to say nothing of its being less profitable to the dentist.

Dr. C. Frank Bliven : In constructing artificial crowns there are three things to be considered—strength, beauty and ease of repair.

Strength is the most essential quality. Take an incisor. You are all familiar with its anatomical construction, and the manner in which the enamel overlaps the dentine. The nearer we conform to these natural principles, the stronger the crown will be. In the selection of a material, I believe we have in porcelain the only material at the present day that answers the purpose. In preparing the borders, the more we cut the tooth away toward the apex, the weaker the crown; for instance, in the Richmond crown the force is applied in an oblique angle, making a fulcrum at the labial point of attachment, thereby having a tendency to lift the pivot from the root, as a tack or nail is drawn with a claw-hammer.

Dr. Van Woert's method, which he has just described, seems to me to be much more practical, because it brings the fulcrum nearest to the point of greatest resistance.

If a cap must be saved, use the band itself to take the measurement, place it around the root with a ligature about it, draw it tight, cut and solder. This, to me, seems the most practical method. The taking of an accurately fitting cap is one of the most difficult things we have to do.

But, with few exceptions, I find it unnecessary to make caps. The burnishing of a piece of pure gold onto a hickory stick, removing it and having it fit the root accurately as a cap should, is almost an impossibility.

Dr. Baker, of Boston, several years ago introduced a method which was a good one, if we do not object to the extra labor. He places a piece of thin copper about the root (tagger's tin is best for this purpose), ligates it to hold it securely in place, and forces plaster of Paris into the open end; after the plaster has set, it is removed, and fusible metal is poured into the end that was about the root. This makes an excellent model on which to construct the cap.

The next point to consider is that of beauty. All methods where the band must show are undesirable. For this reason I strongly object to them, and I rarely find them necessary. There are other simpler and superior methods. Prepare the root like a truncated cone, concaving the labial surface; prepare a platina cornicopia, introduce the pivot at the apex, trimming the platina form so that it will extend slightly under the margin of the gum, and burnish to place. On this form construct an all porcelain crown similar to thickened enamel. For strength, beauty and ease of repair, this method, in my practice, has been prolific of the best results. This crown gives me a border at once strong, beautiful and non-irritating—one that is not approached by any other method with which I am familiar.

Dr. S. C. G. Watkins: This subject is one of great in-

terest to all of us. Dr. Van Woert spoke of the fitting of bands, and the inference would be drawn from his remarks that it was a very common thing to see bands well fitted, and an uncommon thing to see poor work. It seems to me that the majority of bands are fitted miserably. We see much of carelessness, slovenly work in crown and bridge-work. Either men ought not to attempt it, or qualify themselves specially for it. Dr. Case refers to the cutting down of teeth only half-way, and leaving free surfaces which are easily cleansed. That I think, is an excellent idea. When a sound molar, for instance, is trimmed for attaching a crown to it, Dr. Case's idea is to trim the tooth half way to its neck, so as to get a solid bearing. Then fit the cap on that, and burnish the gold band to make a close joint. It seems to me to be a more practical method than covering the entire tooth with gold, and taking the chances of having an imperfectly fitting band under the edge of the gum.

I do not believe in banding in crown-work if it can be avoided. I think a tooth which is crowned without a band is sufficiently strong, and less liable to cause after trouble, providing the root is good, and not cut away too much in its preparation.

The tendency in prosthetic dentistry is toward the use, wherever possible, of artificial substitutes which do not cover the roof of the mouth, as in bridge-work. Where the bridge-work is removable, the patient can keep it thoroughly cleansed. I have been experimenting with much satisfaction, doing away with the covering of the roof of the mouth in pieces containing from one to five or six teeth, by the use of a spring plate. Where, for instance, the second bicuspid is badly decayed, with the first molar on the same side decayed on the two proximal surfaces, and the second molar also decayed on the anterior proximal surface, I have adopted the plan of cutting away the crown of the first molar, which gives perfect access to the cavities in the other two teeth, which are then filled and a crown placed on the tooth which was cut away. My idea is that the operation can be performed in less time, the fillings can be inserted more accurately, and the crown be a more certain protection for the first molar, than the large compound filling which would be necessary.—*Items of Interest.*

ARTICLE VI.

THE NOISY ONES.

Comparisons are always odious. He, who, in private matters, calls himself great, and his neighbor small, is voted a braggart or a bumpkin, yet in public it seems a man may violate all the canons of self-respect in his self adulation, and yet we tolerate him. True, he will adopt a round-about phraseology—he will not tell you directly that he is the greatest dentist alive, but he will tell you he was a student at such and such a school,—he will dilate to you on the absolute superiority of this school, and gently hint he was not the worst student at that school. That a man should love his land, his home, and his school, is well. It is well that he should regard its good points with satisfaction, but he should not close his eyes to its failings. He should learn all there is to learn at home, but he should not rest here. As the great thinker, Goethe, let Wilhelm Meister follow his "Lehrjahre" spent in the home by "Wanderjahre" occupied by travels afar, so an ideal student would seek further knowledge in other lands, and at other schools. At Paris, at Vienna, at Berlin, the English Medical student seeks to extend his knowledge and experience, in the same way that Americans and others garner in what we have to teach in our schools at home. So with dental students, after learning what they can at home, they often go to other schools and learn much there. It is well it should be so, and none but the silliest of silly men, would ever dream of thinking that a student, in so doing, cast a slur on his school at home. If an English student, he remains an English student, who has but added a little to his knowledge, and if an American, he remains an American. As Englishmen, we are proud of our schools, but we hope we may not fall in the error of the braggadocio, and more especially, that we may

never seek to elevate our own schools by decrying others. If we err, may some kind friend check us. And as we hope we may not so sin ourselves, it is also our wish to credit others with the same intentions. From a variety of circumstances, but more especially on account of superior educational advantages, the United States and England have become, for the time, the chief teaching centres of Dental Surgery. Of England we know, and of the States, two interesting papers have recently appeared, the one pessimistic, the other optimistic, treating of the matter. From the first, that of Mr. Bentley, of Chicago, one rises with the impression, that whatever else the schools may be, they are directly antagonistic to the interests of the Profession at large. Why? Because many have been started, not with the idea of teaching, but simply with that of making money. They, therefore, do not much care about the quality of the man they turn out, so long as there is quantity. And not only is the Profession overcrowded with inferior men, but the very schools themselves enter into competition with their own graduates, and this not on equal terms, for, whilst the graduate is debarred by professional etiquette from advertising, the school does so *ad lib.* For this state of things, he sees a remedy in State Examining Boards, an opinion, however, which meets with a direct negative from Dr. W. C. Barrett, in the second paper referred to, who is perfectly satisfied with the present condition of things. Just as on this point we have opinions utterly divergent, so on the question of American, and may be of English Schools. On the one hand, we have men crying themselves hoarse in self-adulation of American, and may be of English Dentistry, so on the other, we have men equally noisy in running down these very things. How is it possible to reconcile such opposite opinions? Briefly, we think this may be done by seeking the opinions of the silent members of the Profession, of those men of sufficient strength of mind to notice the faults in that they hold most dear. As it is not fair to take a braggart at his own

estimate, so neither is it just to blame a Profession for the sins of the few, nor to think that the bulk of this profession have part or parcel in the quack methods and practices with which these few do their best to saddle the whole. True, it is difficult to ignore these noisy members, and far more so when distance prevents our hearing and seeing for ourselves that this verbage represents but a minority in councils and votes on professional matters. Still let us remember:—

“Bean-pods are noisest when dry,
And you always wink with your weakest eye.”

—*Ed. in British Journal.*

ARTICLE VII.

EXPERIMENTS WITH PENTAL.

Extracts from communication of Dr. Ludwig Hattgassy, Assistant Dental Clinician of the Royal University of Buda-Pesth.

In my experiments, the following questions were the subjects of my special attention :

What is the narcotic influence of pental ?

When does the narcotic state commence, and how long does it continue ?

How does the nervous system bear this remedy ?

What is its influence on the heart and the respiratory organs ?

What are the after-effects of the remedy ?

There is no doubt that pental is an energetic and quickly acting anæsthetic. From the inhalation till the narcose, when the operation can commence, it takes on the average $1\frac{1}{4}$ minutes. There were cases when the narcose was so profound after $\frac{1}{2}$ – $\frac{3}{4}$ minutes, that the operation could be then begun.

The quantity of pental necessary to produce narcose cannot be precisely estimated, as it seems to depend on the individual disposition. The smallest dose which produced narcose, was three grains, the average quantity 6-8 grains, and the largest doses 12-15 grains; a larger one than the latter was seldom used.

To determine the narcose, three circumstances are to be observed. First, the condition of the pupil. In seventy per cent. of the cases the eyes are open, in the others the eyes remained open even after lifting the lids, so that we can continually observe the pupil; by this we learn that during the narcose the pupils are always more dilated, and the narcose occurs at the middle dilation. The pupils either do not react at all against light, or only minimally. When, therefore, the light reaction does not take place, when pupils are dilated, the narcose is sufficiently deep for the operation.

A second symptom is the insensibility of the skin. When, for instance, we pinch the underarm, and no reaction takes place, we are near the time to commence the operation, but it is always better to continue the inhalations five or six times after this test, to make it certain.

My experiences about the blood-vessels were, that in twenty per cent. of the cases observed by me the pulse remained uniform quantitatively as well as qualitatively, wherefore I have also accepted the action on the heart in these cases as unimportant. In some of the other cases no great changes took place, yet the beating of the pulse was both rarer and weaker. In others, the pulse was slower soon after the inhalation, which often was followed by a quantitative increase. Very seldom I have seen a light cyanose, and never so prominent as it occurs with laughing gas. It was evident, however, from all observations, that this agent has, in some individual cases, a strong effect on the heart, so that this must be carefully watched.

Concerning the duration of the narcose, if it be a superficial one, the patients wake immediately after the operation;

if the narcose be a deep one, they remain in a soporous condition for one to two minutes. Sometimes the awakening takes place after five minutes, and then the patient remains soporous for a long time.

Of the after-effects we are quite satisfied. Even where organic disease exists and pentol was administered, the patients bore well the narcose.

During the operations, it is absolutely necessary that the chest be free from all clothing whatever; and it is also necessary that an assistant be present during the narcotic state, not only for the sake of making observations, but also because the excitement stage of the unconscious individual is often so violent, that one person can not subdue it.

In conclusion, it must be admitted that pentol is a strong remedy, which acts with intensity on the heart as well as the nervous system, and it cannot be recommended in private practice in larger operations. The indications are, however, that in operations requiring the least time, and with skillful manipulation, pentol is preferable to either laughing gas or bromether.—*Items of Interest.*

Editorial, Etc.

DENTISTS AND THE CENSUS.—The April number noted that a bill had been introduced into Congress in March providing penalties for refusal to answer questions included in the schedules of the Census Office, and the May number referred to the unanimous action of the Maryland State Dental Association in appointing at its ninth annual session in May a committee to convey to the Senators and Representatives of Maryland in Congress the protest of the dentists "against the action of the Census Bureau in classifying dentists as manufacturers."

This committee acted promptly in the matter, visiting

Washington on several occasions and agreed upon an amendment to the Bill to be introduced before it was reported to the Senate (as it had already passed the House of Representatives), providing that nothing in the Act "shall be construed as authority to collect statistics from professional men, such as lawyers, physicians and dentists."

The House Bill, it should be stated, gave the Secretary of the Interior and his subordinates in the Census Bureau the authority to include dentists in the schedule of manufacturers, and to compel them under severe and unprecedented penalties to give detailed statements of their entire business.

The Committee was finally given a hearing before the Senate Committee on the Census, with a view to having the amendment referred to added to the bill, so that if it became a law it would not affect dentists. The matter was so effectually put not only by the representatives from Maryland, but also by committees from District of Columbia, Pennsylvania and New Jersey, that the Superintendent of the Census agreed in writing "with the representatives of the Dental Association present at a meeting of the Committee on the Census to carry out the spirit and purposes" of the amendment.

Following is a copy of the memorial presented:

To the Senators and Representatives of Maryland and other States, in Congress Assembled:

GENTLEMEN:—

At the last annual meeting of the Maryland State Dental Society, held in Baltimore, on May 9th and 10th, the following resolution was unanimously adopted:

"WHEREAS, a bill has been introduced in Congress, which provides that any person who shall neglect, or refuse to give information to census officers, shall be subject to a fine, "not exceeding ten thousand dollars, to which may be added imprisonment, for a period not exceeding one year," and whereas the public press reports that the bill referred to, "will be used in the nature of thumbscrews and spiked boots to enforce replies," and further, that "the dentists of Baltimore, who by their refusal to answer certain questions * *

* * * * will be the first victims of the inquisitorial machine if the bill is passed;" therefore,

RESOLVED, That this Association re-affirms the resolution unanimously passed November, 1890, protesting against the action of the Census Bureau, in classifying dentists as manufacturers and refusing to fill out blanks.

RESOLVED further, that the chairmen of the several standing committees, as now constituted, be appointed to convey the sentiments of this Association to the Senators and Representatives of Maryland in Congress, and urge them to have the bill referred to amended, so as to omit dentistry in all its branches, from the tabulations of the census."

We therefore, the undersigned, the committee appointed in accordance with this resolution, respectfully submit the following to your consideration :

1. Dentistry is recognized as a profession by law. Dentists are not required to serve on juries; they have been recognized as professional men, to wit: in the case of Noble, before Judge McArthur of Washington city. The dentists of Baltimore have always been excused from jury duty.

2. Nearly all States of the Union have passed laws recognizing them as professional men, and in some of the States license fees are demanded from both physicians and dentists for the privilege of practicing, and both are equally amenable to the law of malpractice.

3. Most of the States have appointed examining boards, to test the fitness of candidates for practice. Similar laws are made bearing on the medical profession.

4. Maryland, Pennsylvania, New York, Massachusetts, Michigan, Minnesota, Kansas, Iowa, Illinois, Indiana, Missouri, Tennessee, Georgia and Louisiana, have through their respective Legislatures granted charters to dental colleges, giving them authority to educate students in dentistry, and to confer upon those properly qualified the professional degree of Doctor of Dental Surgery.

5. In the National University's dental department in the

city of Washington, D. C., the diplomas are signed by the President of the United States. This we think originated with General Grant.

6. Almost all the great Universities including those of the city of Washington, have added dental departments, and are granting professional degrees by the authority of the United States Government.

7. The American Medical Association has recognized dentists as specialists in medicine, and the International Medical Congress of the whole civilized world has done the same.

8. Dentists have given to the world the first anæsthetics, both nitrous oxide gas and ether, which Dr. Oliver Wendell Holmes has declared "the greatest boon ever given for humanity." They have also furnished the first splint really satisfactory in the treatment of fractured jaws. This splint was applied in the case of the Hon. W. H. Seward, with entirely satisfactory results, and this after the medical profession had utterly failed to reduce the fracture.

9. Both general and oral surgery are impossible without mechanic, and all operations both in general and oral surgery are more or less mechanical.

10. In the past, both surgery and dentistry were classed among the trades; but time, progress, cultivation and advancement have altered the condition of things, and to-day surgery has its place on the top round of the medical ladder.

11. The manufacturer makes out of certain materials a new product and offers it on the market for general and indiscriminate use, as for instance a brickmaker does.

12. Dentists are not, in the ordinary acceptance of the term, either mechanics or manufacturers, any more than the general surgeon. He applies his manufacture, such as the improved splint or the pessary, as the case may be, altering his product as the necessity of the case may demand, and does this through his professional knowledge of Anatomy, etc., aided by manipulative ability and mechanical skill. The dentist does precisely the same thing. The oculist adjusts and fits

artificial eyes by fitting and grinding as the dentist does artificial teeth.

13. Artificial sets of teeth cannot be offered for sale giving each customer an opportunity to select what he likes, for no set of teeth could fit, or ever be fitted, to any but the one individual for whom it was especially made; therefore, no one can select a set of teeth as he might a hatchet or hand saw or any other manufactured articles in market.

14. Dental manufacturers are never classed by business men with dentists; we are a separate and distinct body of men.

15. The Census Report of 1880 declares, "That persons following individual pursuits shall be classed together," and we find in that Report headed, "persons engaged in selected occupations," Lawyers, Physicians, Dentists, Druggists, Preachers, etc., classed together. That in the Census of 1880, the precedent is established; and as a matter of fact under instructions from the Superintendent of the Census, General Francis A. Walker, the reports which dentists made in the city of New York were returned to them, and no further attempt was made to classify them as manufacturers, and we respectfully refer you to the correspondence between Dr. Thomas E. Gunning, of New York, and Gen'l Walker at that time.

16. The druggist from manufactured ingredients makes a new product to relieve suffering humanity. The dentist does the same thing.

17. We would call your attention to the fact, that all the materials used by the dentists, have or should have been classed under the head of "dental manufacturers." This is true of gold and other metals used in dental practice as well as of instruments, artificial teeth, rubber, etc.; there is no exception to this.

18. Many Dental Associations have forcibly expressed their sense of the great wrong done to the dental profession by being classed with manufacturers, when no other specialty of medicine is so treated.

We would appeal to your sense of fairness. We claim to be a respectable and law abiding profession and ask justice at your hands. For more than fifty-one years we have worked steadily and faithfully to gain our position and standing. This effort dates from the founding of the first College of Dental Surgery in the city of Baltimore.

We trust you will see the injustice of deposing us from our honorably acquired position as professional men, and relegating us to our starting point. We appeal to you, as officers of this great country to save us from this great wrong, which will undo the work of half a century.

You can readily replace us to where we were in the Census of 1880, in the list of "persons engaged in selected occupations." At this time all Dental Colleges in the United States are raising the standard of culture, and have increased the time required for preparation for graduation from two to three years.

A rigid examination has to be passed in Anatomy, Physiology, Pathology, Histology, Therapeutics, Materia Medica, Chemistry and Oral Surgery, before the Degree of Doctor of Dental Surgery is conferred. Is any such requirement made of any manufacturer?

Leaving this statement in your hands, we feel confident, that when fully informed of the facts of the case, you will in your wisdom do justice to our profession.

Very respectfully,

ED. NELSON, D. D. S.,
R. B. WINDER, M.D., D.D.S.,
T. S. WATERS, D.D.S.,
A. J. VOLCK, PH.D., D.D.S.,
WM. A. MILLS, D.D.S.,
DAVID GENESE, D.D.S.,
W. S. TWILLEY, D.D.S.,

Committee.

Communications.

TO THE DENTAL PROFESSION.—For more than a year I have been using in my practice in this city a method for obtunding sensitiveness in dentine, which is original with myself and wholly unlike any process used hitherto for this purpose. I have now so far perfected my appliance as to be able to announce in the face of your incredulity, that *I have found a way to avoid every vestige of pain in filling teeth*, with complete safety to the pulp and to the absolute satisfaction of the patient. All dentists will readily appreciate the effect of this unique auxiliary upon my practice. Through its instrumentality my patronage has increased until now eight dental chairs are used, and I have established its value beyond question, not alone to my patients in the relief from suffering, but to myself as a money winner. I am lead, therefore, to offer my new method for painless filling to the profession, and one dentist in each town or city can secure the same by purchase. Applications will be favorably noticed in the order in which they are received. Address all communications to

C. E. HALE, D.D.S.,

St. Paul, Minn.

Monthly Summary.

MEDICINE IN VEGETABLES.—The following information may be useful to some, if not new to many: Spinach has a direct effect on the kidneys; a common dandelion used as greens is excellent for the same trouble; asparagus purges the blood; celery acts admirably on the nervous system, and is a cure for rheumatism and neuralgia; tomatoes act on the liver, beets and turnips are excellent appetizers; lettuce and cucumbers are cooling in their effects on the system, onions, garlic, leeks, olives and shallots, all of which are similar, possess

medicinal virtue of a marked character, stimulating the circulatory system, and the consequent increase in the saliva and gastric juices, promoting digestion; red onions are an excellent diuretic, and the white ones are recommended to be eaten raw as a remedy for insomnia. A soup made of onions is regarded by the French as an excellent restorative in debility of the digestive organs.—*Herald of Health*.

THE WAY TO RAISE A TOOTHACHE.—“If any one really wishes to raise a toothache that shall cause him to be remembered, let him put arsenical paste in a wet cavity, the pulp being covered with refuse matter and decayed dentine, and then let him cap the climax of the outrage by thrusting into the outer cavity cotton wet with a sandarach solution. This will permeate the whole cavity, encapsule the arsenical paste, and prevent its action, while it serves as a constant irritant. In a few hours it will decompose, and the cavity will become foul almost beyond conception. We think it is really the worst covering for a temporary dressing of which we have any knowledge, and we have had experience enough with it to be expert in judging its demerits.” *Dr. W. C. Barrett*.

MANIPULATING CEMENTS.—Dr. Wassall says: “I think there are two secrets in the use of cements that will give us better success with them. First, to take just enough of the plastic material on the instrument to fill the cavity, and bur-nish it until it is exactly full, so that it will not need to be cut or ground down after it has hardened. This leaves a surface which has an outside gloss to it, of a condensed vitreous nature. The other is to give the cement more time in setting before the rubber-dam is removed. It was Dr. Harlan who told that he allowed the rubber to stay on, as an invariable rule, one hour, after making a cement filling, and I have found it of great value.—*Ohio Journal*.

ACUTE CORYZA.—Dr. M. D. Lederman, of New York, finds the following mode of treatment very beneficial during the congestive stage of an acute nasal catarrh. The nasal chambers are sprayed with any of the antiseptic solutions, Seiler's preferred, until they are sufficiently cleansed, and then the following solution is used :

R Cocaine	.	.	.	.	.
Menthol,	.	.	.	.	aa gr. xx
Benzoinol	.	.	.	.	℥ ij

M. Ft. solution.

The feeling of fullness in the nose, associated with the dull frontal headache, is no doubt the result of extreme congestion. For the relief of these symptoms, cocaine has been used for a considerable period, but it has been found that its effect soon passes off, and the patient is left in the same uncomfortable position as before. To obviate this menthol was added to the solution. Menthol is a local anæsthetic, and in combination with cocaine, it keeps up the local depletion and leaves a pleasant coolness in the nasal chambers, enabling the patient to breath through the natural passages. Benzoinol is used in this solution as the menstruum, on account of its bland and unirritating qualities, and freedom from unpleasant odor.—*Brooklyn Medical Journal*.

THE CONTRACTION OF RUBBER-PLATES.—The fact is well established that vulcanite contracts in cooling, and, in consequence, dental plates made up with section teeth almost invariable warp, and require more or less manipulation before a satisfactory fit is secured. In the case of upper plates, the change is quite apparent, the rear palatal portion being thrown up, causing the plate to rock. The arching up of this part of the plate is caused by the contraction of that portion immediately behind the teeth, the thin palatal part acting as a stay, and diminishing to some extent the amount of change experienced.

When, in repairing an upper plate, the center portion is sawed out, it will be found that its heels will spring together,

certainly as much as the amount removed by the saw cut, and sometimes even more. This shows that the same action takes place with lower plates, and to a greater extent than with upper ones. As they leave the vulcanizer, full lower plates, with section teeth, are always sprung together at the heels, and are too narrow for the mouth. If they are re-vulcanized, they are thereby made still narrower, and are, thereafter, in many cases, not capable of being worn with comfort. If they are heated sufficiently to soften the rubber and are then widened, the beneficial effect upon the fit will be quite apparent.—*Dr. Snow in Practitioner and Advertiser.*

CLEAR SHELLAC VARNISH.—To get an absolutely clear solution of shellac has long been a desideratum, not only with microscopists, but with all others who have occasional need of the medium for cements, etc. It may be prepared by first making an alcoholic solution of shellac in the usual way; a little benzole is then added, and the mixture well shaken. In the course of from twenty-four to forty-eight hours, the fluid will have separated into two distinct layers, an upper alcoholic stratum, perfectly clear, and of a dark-red color, while under it is a turbid mixture containing the impurities. The clear solution may be decanted or drawn off with a pipette.—*National Druggist.*

POISON OF THE TEETH.—Biting the nails is an exceedingly dangerous practice, as the biter never knows when to stop, and at any moment is liable to bite into "the quick" and cause blood poisoning. Even when the utmost care is taken of the teeth a poisonous secretion is apt to collect on them, and the entrance of a minute portion of this into the circulation may prove as certainly fatal as the pus on a surgeon's scalpel.—*Boston Herald.*

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ARTICLE I.—ORIGINAL.

MARYLAND STATE DENTAL ASSOCIATION.

The annual session was held May 9 and 10, 1892, in St. James' Hotel, Baltimore; Cyrus M. Gingrich, D.D.S., President, in the chair; W. W. Dunbracco, D.D.S., Secretary.

(Continued from page 61.)

REPORT OF COMMITTEE ON OPERATIVE
DENTISTRY.

BY A. N. SWEENEY, D. D. S.

Since the last meeting of this Association the publishers of dental literature have not been called upon to chronicle any new and startling discovery. No bold and brilliant operation has been introduced to furnish the topic for general discussion, the *perfect* filling material has not been discovered, neither has any method to obviate all necessity for fillings, through the prevention of caries, been devised.

Upon more careful consideration, it would seem to be a rather humiliating acknowledgment to state that a number of months should roll around without the presentation of *something* worthy, at least of passing consideration, either in the line of new remedies, appliances or methods, or in the detection of some old errors hitherto masquerading in the guise of truth, and it is the hope of being able to call attention, in a very general way, to some item which may furnish food for thought and stimulate useful discussion, which must be offered in justification of this paper.

The field of therapeutics is a wide one, in which many enthusiastic workers are constantly engaged, and we see the fruit of their labors brought forth, from time to time, in the form of new preparations, or old ones under new and improved forms. Some of these are of especial interest to the dentist, and though very many fall far short of realizing the hopes of the introducers, this does not serve to deter investigation; but, on the contrary, the repeated failures seem only to stimulate to greater zeal and increased activity.

That class of preparations known as germicides continues to absorb a great amount of attention, and though some one has lately complained that we are at present suffering from the effects of a "fever" or "boom" in this direction, which must soon subside, no one can close his eyes to the magnificent achievements which have been the reward of investigation of this one line of remedies, for in no other department of scientific research, perhaps, has the success been greater, and in none is investigation pushed with greater enthusiasm. What the perfect germicide of the future will be, it would be unwise to predict. That it has not yet been determined upon is evinced by the fact that the search still goes on. Indications seem to point to the conclusion that the bi-chloride of mercury does not fulfill all expectations. Those of you who attended the last meeting of this body had the pleasure of witnessing a demonstration of the diffusive properties of

pyoktannin and listening to an interesting description of its various virtues by the late, lamented Dr. W. H. Atkinson; and yet the interval which has elapsed since then seems to have conigned pyoktannin to a place among the long list of failures.

A paper lately read by Dr. H. A. Kelly of the Johns Hopkins University places the long familiar permanganate of potash in the very front rank of germicides, while carbolate of camphor is also a candidate for first honors in that class.

As a boon to both dentist and patient, who have alike suffered long from the offensive odor of iodoform, it may be stated that aristol seems to possess all its virtues without its one glaring vice.

Some progress has been made in the direction of the long-felt want of a practical, safe and efficient obtundent of sensitive dentine. The most recent efforts to supply this need seem to have been directed toward the attainment of this end through the application of such directly opposite agencies as heat and cold, and while there is nothing new in principle with either method, the means of application have lately been much improved. Hitherto any apparatus designed for the application of intense cold has been more or less complicated, expensive and variously objectionable, but we now have provided in the little glass tubes of ethyl chloride something at once practical, convenient and cheap, which will be found effective in many cases, while the means of applying heat, either alone or in conjunction with some drugs, have also been much improved of late. A detailed description of a number of these appliances and their action will be found in a late issue of *Items of Interest*.

Some recently published reports would seem to indicate that the subject of the conservative treatment of the pulp was, just now, receiving rather more attention than it has appeared to have received for some few years, and though it is hardly to be desired that we should see a re-

vival of the attempts to amputate portions of this organ and preserve the remainder in a state of usefulness, such as were made some years ago, it is a subject worthy of attention and one which should receive always due consideration. To devitalize promiscuously every pulp which may offer, simply because there may be more or less exposure, is clearly bad practice, yet it is probably the practice of many.

The treatment of peri-cemental inflammation and alveolar abscess naturally brings us back to the consideration of germicides; but while the chemists are busy at work trying to produce the infallible preparation, which shall prove to be "sure death" to all germ life, the busy, every day dentist, who, as a rule, is not a brilliant success as a chemist, can rest tolerably easy in the knowledge of the fact that with a few of the old reliable preparations, which all have known since they were boys, backed by a fair amount of brains, and assisted with a good outfit of modern instruments, can, provided he will honestly and faithfully use these means, cure nearly all his abscesses. A member of this Association has lately been meeting with very gratifying success in the treatment of these cases by the use of listerine alone, which he supplies to his patient and directs him to use thoroughly and frequently; but as the gentleman is present, the details of his treatment had better be obtained from him in person, since it is not the writer's wish "to steal his thunder."

Of the various filling materials amalgam now attracts a great deal of attention. A vast amount of study and experiment have been devoted to this subject, with the result that many most excellent alloys have been compounded and are now obtainable. The senseless prejudice against this class of filling which existed up to a recent date has largely passed away, and it has come to be generally accepted that amalgam is not, *per se*, simply a cheap and inferior substitute for gold. Now that the falsely nurtured discredit which attached to the use of this material has

disappeared, in addition to the regular manufacturers of the article, many dentists are earnestly engaged in turning it out under formula of their own, so that we may now be said to possess, in addition to the regulars, a class presenting a seeming anomaly, that is a class of professional people who are yet amateurs, amateur amalgam makers, and the result of their combined efforts is that the number of "brands" turned out almost passes computation. This is praiseworthy, however, and many excellent samples of alloy have been produced by the amateurs. One of the very latest candidates for favor has brought out what is termed an aluminum amalgam, and it is possible that the so-called "metal of the future" may partially substantiate its claims through the excellence of the alloys of which it may form a component part. But in the list of alloys, white and colored, there seems to be one "black sheep," of which the worst was not said when it was pronounced to be "a nigger." Copper amalgam has not fulfilled the wonderful promises made for it. Many careful members of the profession were very shy of it from the outset, and many of those who rushed headlong into its use, in the belief that they possessed in it "the one thing needful" (in an amalgam) have had ample time to repent at their leisure.

Among other plastics, the oxy-phosphate of copper is now attracting attention, and it is to be hoped that the metal may, in that form, atone for its shortcomings as an alloy.

About June last Dr. Timme, of New York, visited this city and introduced his process of making inlays, presenting in it a simple and practical method, fully within the reach of all, of employing this useful method of filling conspicuous cavities. It may be noted also right here that a number of ingeniously designed rubber-dam clamps intended to facilitate the filling of labial cavities have been lately put upon the market, showing that this troublesome class of cases has been receiving renewed attention.

The subject of gold filling is one about which it might seem best to remain silent, for the amount of writing already done and the discussion indulged in about it have been simply immense. To the outside observer it might seem to be the most incomprehensible thing about the dental profession that the matter of how to fill teeth with gold was not definitely settled long ago, so that discussion might have had time to cease. Gold has been used to fill teeth for many years, and gold is a simple substance, unlike an alloy. Where, then the cause for so much contention? Almost all dentists fill with gold; what proportion of them do so with any near approach to true success?

Your last report dealt at considerable length with this subject, and treated it in so plain and practical a manner as to obviate all need for details at this time. While disclaiming all desire to detract from the merits of non-cohesive gold, the paper took strong grounds in favor of the cohesive preparations. Undoubtedly, from the standpoint of a majority of those in practice to-day, these views are correct. The discussion which followed the reading of the report developed the usual differences of opinion, for while there were those who were ready to champion the cause of non-cohesive gold, the advocates of the cohesive were well represented, and one of their partisans so thoroughly felt "the courage of his convictions" as to declare that "any cavity that can be filled at all with non-cohesive gold can be *better* filled with cohesive." Unfortunately, of the comparatively few members of the profession who are recognized as holding the position of teachers to their brethren, by virtue of their gifts as writers and public speakers, many have fallen into the habit of investing their individual ideas with too great a semblance of authority. This is to be regretted, as the willing disciple is often perplexed when confronted with some point on which the "doctors disagree." Now had our old friend contented himself with a personal application of his views, and said that

he, himself, could fill any given cavity better with one form of gold than with another, no exception could be taken to his remarks. For some reason, probably the result of early training in many cases, the preference for one or the other of the preparations of gold known as cohesive and non-cohesive amounts to a passion with very many dentists, which causes them to stick to their particular idol with a tenacity of purpose which finds almost its only parallel in the attachment manifested to early inculcated religious or political faith: hence statements similar to the one above quoted, or the converse of it, are not infrequent. In a series of articles from the pen of Dr. Ottolengui, now running in the *Dental Cosmos*, under the head of "Methods of Filling Teeth," the author expresses himself as unable to discover any use for the non-cohesive form of gold whatever.

Now the truth of this matter would seem very easy of discovery. The requirements of a gold filling are not so wonderfully numerous or complex as to be with difficulty understood. Its main use is to fill up the space left vacant by loss of tissue, caused by disease, in such a manner as to arrest further waste, to restore function and comfort to the tooth, and to present a reasonably good appearance. Leaving large contours out of the question, since there should be none with regard to the preparation of gold used for such operations, any two simple fillings which will show equal durability, comfort and good appearance are equally good, without regard to the fact that one is made of cohesive gold and the other of non-cohesive.

Where results, then, are equal, what advantage can one preparation have over the other? Simply this, that preparation of gold is best for a given case which can be successfully introduced at the minimum cost of strain upon the patient and fatigue of the operator. Results being equal, he is the better operator of two men who can select his preparations of gold so as best to suit his cases, and, on occasion, is able to use them all well. It may be said,

therefore, with profit alike to the all-hand-pressure as to the all cohesive gold operator, Go learn the other method. Put the small end of your opera glasses to your eyes, and you will be surprised how the field of vision is expanded.

When the strictly cohesive gold operator admits the need of some form of sponge gold to start certain fillings, on account of its softness and easy adaptability, and yet deploras the tendency of such gold as Steurer's to crumble to pieces in handling, let him provide himself with some of Abbey's non-cohesive foil, and he will find that it too has "adaptability," while ordinary handling will not injure it in the least, and he can finish out his filling with cohesive gold from whatever point his judgment may lead him to consider best. Should he find difficulty in handling this gold at first, some good, old friend who practiced when his father was a boy will take pleasure in showing him how to manage the wedging. True, it has been charged that this particular brand of gold has some impurities about it which serve to render it so utterly non-cohesive, but Dr. Bonwill told you that he had gone through the works and examined very carefully, and that the charge is false. Let that be as it may, the gold will stand in the mouth, and that is the practical issue. On the other hand, to see a man laboring over a large filling, crowding in sheet after sheet of gold by hand pressure, and a great amount of it, in these days when equally good or better results can be attained with so much less waste of energy, is to experience feelings of pity, chiefly for the unfortunate patient.

The various forms of mallets now in use are likewise subjects of preference and prejudice among those who use them, and here again comes in the danger of allowing one's judgment to be warped by the latter influence. That useful old instrument, the automatic, has lately come in for a rather severe arraignment at the hands of a popular writer who states that he used it extensively until it was, one day, used on himself. Experience shows that indivi-

dual patients vary greatly in their estimate of certain appliances. A highly nervous lady, who could never tolerate the automatic, was delighted the first time the electric mallet was used, and insisted on its use ever after, while a similarly nervous gentleman pronounced the electric mallet "the vilest thing" he had ever seen, and expressed great satisfaction when the automatic was substituted; so it may be readily seen that individual peculiarities of temperament play an important part in determining the selection of appliances to be used with different subjects.

It is the writer's opinion that a skillful operator should be familiar with the use of all the three forms of mallets, namely the hand, the automatic and some form of power mallet, and should be fully able to fill successfully entirely by hand pressure.

As there is a separate paper on crown and bridge-work, it is unnecessary and would even be discourteous to attempt anything more than a simple allusion to the subject here. Crowns, in their now numerous forms, are very generally adopted by the profession. They are a great boon, and perhaps the only caution which may be mentioned with regard to their use, apart from the well-known necessity for great care in their adjustment, is to avoid a too hasty recourse to such a radical method of treatment, in many cases where moderately extensive fillings would serve as good or, possibly, a better purpose.

Bridge-work is still regarded by a large number of practitioners with distrust. The cause of this is not far to seek, when it is disclosed that many base their opinions of this work upon the experience of persons who have attempted to wear improperly or unskillfully constructed appliances miscalled "bridges." Such as are doubtful of their ability to successfully cope with the difficulties of this work had far better leave it to other hands; and certain it is that if there be any field for what is commonly called "cheap dentistry" it is not discoverable in the direction of making this class of appliances, for all poorly

and carelessly constructed bridges are exceedingly likely, not only to prove highly unsatisfactory to the wearers, but will serve to bring discredit upon this great achievement of modern dentistry.

But little has appeared in print for some time about the operation of implantation, though some items upon this subject, and the kindred one of replantation, are to be seen in some of the publications for the current month. Had time permitted, it would have afforded pleasure to have communicated with the eminent man whose name must ever be associated with this operation, and had from him the results of his later experience.

It is a matter of regret to the writer that a paper containing so much good, practical advice, and, in the main, so commendable as the last report presented to you by the committee on operative dentistry, should have advocated so strongly the practice of extracting the sixth year molars. These teeth are declared to be, in the present generation, but little more than temporary, and it is advised that, in nine cases out of ten, they had better be extracted.

Some adverse criticism was noted against this portion of the paper at the time it was read, but the discussion wandered into other channels, and the acceptance of the report, as a whole, caused a notice to appear subsequently in the *Dental Cosmos* to the effect that this Association endorsed, among other recommendations, the extraction of the sixth year molars.

Whatever may have been the individual views of the majority of those present at that time upon this subject, the writer feels called upon to protest, in no uncertain manner, against the continued adherence to this antiquated method of practice, and hopes that the Maryland Association will go on record as in accord with many of the bright and progressive spirits of the profession at large, who are at this moment speaking and writing in earnest protest against the continuance of this pernicious practice. You heard the charge in your president's address last

evening that "we have done very little in Maryland to add to the material interests and elevation of the profession at large." In the name of reason, do not lay us open to the far graver charge that Maryland constitutes the last stronghold of barbarous and obsolete methods.

To assume that the usefulness of a set of teeth, as a whole, could, in the great majority of cases, be increased by the loss of the largest and strongest of its number, would not seem, on the face of it, to be in reasonable conformity with natural laws, no matter whether we recognize in these laws the workings of a Divine Will, evolution or transformism. If these teeth be so nearly worse than useless, and if it be true that they are so rapidly progressing, rather retrograding, toward the temporary type, where are the evidences of any effort of nature toward their suppression?

The popular idea that these teeth are essentially so much more frail than their neighbors is, at least, possibly open to question. True it is they are very frequently found at an early age suffering from extensive ravages of caries; but the ignorance and neglect of parents will often as nearly account for this state of affairs as will any real structural inferiority of the teeth, and in a great number of instances where they escape the critical period of early life, they will be found to compare very favorably with the other teeth. But whether more frail or not, there are now resources at our disposal which may be made available for their salvation, hence to condemn them to almost wholesale slaughter would not seem in keeping with the spirit of the present age.

For the correction of irregularities the removal of some teeth will often become necessary, yet even for *this* cause there is a decided, and apparently growing, opposition to the arbitrary selection of the first molars for extraction. In order to demonstrate that the views here advanced are not merely individual, but that they are shared in by certain writers and thinkers in the profession whose

opinions are entitled to respect, and that the only motive in bringing them forward is the hope of keeping the members of this Association "in touch" with the best modern thought of the profession, a few random quotations from recent publications will be offered in closing. Dr. Ottofy, in *Items of Interest*, March, 1892, says: "I think it bad practice to extract the first molars, when badly decayed, with the hope that the second and third will fill the space. I do not think, with the methods we now have of saving the first molar, that, generally, it need be extracted and we do not gain as much by that practice as we desire. The articulation becomes disturbed, both by the dropping of the teeth forward and backward, inward and outward. The second and third molars seldom articulate as properly if the first molars are absent as when they remain. Also, unless the second molar moves forward" (which it frequently does not) "we will lose an exceedingly large tooth, and one which is better adapted for mastication than any other by virtue of its location and the relation it bears to the fulcrum and the muscular power exerted by the jaws. We can exert more force at that point than at any other; hence, when possible" (to avoid it) "it is not good practice to extract that tooth with the hope of having some other tooth do as much good."

Dr. Ottolengui says in *Cosmos* for this month, speaking of badly decayed first molars, "So far from considering these teeth good subjects for extraction, I take unusual pains to save them."

In the report of a paper read by Dr. H. V. Jackson at the meeting of the American Dental Association in August last, published in the *International Journal* for the current month, occurs the following: "The extraction of teeth that is so common to prevent crowding should be discarded. If there be insufficient room for the eruption of the teeth, it is better to expand the arch, which is easily done by means of the crib. Correcting the position of inferior incisors will often correct the superior if done while they are erupting."

In *Items of Interest* for April 1892 a question is asked by some one as to whether the first molars or two of the bicuspid's had better be extracted in order to correct an irregularity of the cuspid's. The answer is given editorially that, all things considered, the bicuspid's had better be taken. It is admitted that the first molars may be selected, should the querist much prefer it, but he is warned that such a course "is likely to result in more experience than satisfaction."

To mention the name of Dr. N. W. Kingsley, is to cite a universally acknowledged authority on irregularities of the teeth. In the *Dental Cosmos* for January, 1892, occurs the following very candid statement from him, in giving a description of a case which he had treated: "As a proper correction of this deformity required the incisors to be carried backward somewhat, and as there appeared to be no spaces in the arch which would permit of its contraction the first, or sixth-year, molar on each side was extracted.

"These particular teeth were chosen for extraction in preference to the first bicuspid's (which in many cases of protruding incisors would be proper), because they offered more resistance to the correction of the malformation of that region than any others, and *that*, together with the apparent necessity for extracting one tooth on each side to provide for retraction, seemed ample justification for the removal of two perfectly sound molars." But in a foot-note at the bottom of the page he says, "I am convinced by a study of the case since the correction was completed that the extraction of those permanent teeth was unnecessary. I find now to my surprise, that although there then appeared no room to carry the incisors back without extracting two teeth, there are now ample spaces among the teeth on each side to permit of another tooth."

In the face of such testimony as to the doubtful results of extraction even for the purpose of treating pronounced irregularity, what must be thought of making it a

general rule of practice where no marked irregularities present?

After having gotten some of the "experience" to which the editor of *Items* refers in the treatment of irregularities where the first molars had been extracted, to say nothing of witnessing the spectacle of a lovely society belle, one side of whose inferior maxilla was bent almost into the form of a letter V, from the ill-advised removal of a first lower molar, leaving the crown of the second molar tilted forward very much and almost half an inch short of articulating with the upper teeth, it is scarcely to be wondered at that the writer *does not* favor the general extraction of the sixth year molars.

After reading his paper Dr. Sweeney said: "I would say that, to my mind, any one who had the pleasure of being here this morning and listening to the address of Dr. Bonwill, even though, before this, he had some lingering preference for the extraction of the sixth year molars, must have been converted."

DISCUSSION.

Dr. David Genese.—While the report which you have just heard calls for some remarks it is difficult to attack. I will attack it at its weakest point, copper amalgam. In the year 1867 I put some copper amalgam in the first molar for a gentleman in England and about five years ago the filling was still good. The turning black of copper amalgam is caused by using an iron bar in filling the copper in, for this produces copper sulphate which quickly turns black on being exposed to acid.

Now the point of porcelain inlays. I have experimented with them and they failed every time. I find that the fillings instead of being porcelain are glass just covered with a light coloring. I advise the method of filling the matrix with wax, then you can make a true inlay. Now comes the most difficult part of all and that is cementing it into the tooth. You all know that a polished surface will not

permit it. After waxing the surface of the inlay I make scratches through the wax and then put it in hydro-fluoric acid. In this way I get a fairly rough surface.

Now about the conservation of the sixth-year molars. I have given much attention to this subject. I must say that my success in this city has come from conserving the sixth year molars.

Dr. E. P. Keech.—I want to commend the paper and to express my thanks to Dr. Sweeney for what I consider an exceedingly well written paper on this subject. In regard to the sixth year molars I am very glad that Dr. Sweeney has taken the position he has. It has always been my practice to conserve the sixth year molar tooth for the reasons stated by Dr. Sweeney. Being the largest and strongest they are the most useful grinders of the teeth. In regard to the view that the second and third molars move forward and take the place of the first molars when they are taken out, it is not at all certain that they will do so. If the sixth year old molar is to be extracted it must be done before the twelfth year old molar makes its appearance. After it has appeared the extraction of the sixth year molar should be avoided if possible. I confess that I find the third molars frequently wanting. Again I find that two of the *dens sapientiae* will be represented and no more.

Dr. Bonwill.—On the conservation of the sixth year molar. The older I am in dentistry the more conservative I become of every tooth. And if there is any one tooth for the preservation of which I am more particular, it is the sixth year molar, for there is no one tooth the loss of which disarranges the articulation of the teeth more than the loss of this one. By all means save every tooth you can, gentleman. If you commence early enough you will not need to do crown and bridge-work.

In regard to operative dentistry we have not a system. There is nothing known of the general practice of dentistry. If a patient goes from one dentist to another he will not know what has been done by the first dentist.

Dr. Sweeney.—I would like to say a word or two. Dr. Genese said he proposed to attack the paper in its weakest point, copper amalgam. What I said about copper amalgam was not from individual experience, because my experience with it has been in letting it alone. I have used a little of it. I am not a success as a chemist but express the views of those who are. One complaint of it is not that you never find a good filling, but that you are utterly unable to determine what it is going to do. That it is utterly unreliable. He claims that it is not the black colored ones but the gray ones which turn out badly.

In regard to Dr. Timme's preparation I don't think you will find that in my paper I recommended it unduly. I wanted to bring in a few things which were new. I mentioned Dr. Timme's preparation because it was new.

Dr. Joseph Roach.—What must I do with the sixth year molars?

This is a question which confronts every operator in his examinations of the maxillas in female patients ten years old and male patients eleven in age, and requires much thought before deciding as to the retention or extracting them, for we will certainly add or detract much from the use and preservation of the patients' teeth.

I have, during the last three years, had quite a number of children patients, and have noticed that in nine of ten cases, the sixth year molars ought to be extracted.

In nearly all American children (Caucasian) we find that there is not room in the arch for the teeth. The wisdom teeth are frequently poorly developed and out of the arch; the six anterior teeth and bicuspid are frequently irregular. These, I think, are good reasons for extracting the sixth year molars. We give room to the twelfth year molars, make space for the perfect development of the wisdom teeth, and better space and preserve the teeth of the entire arches. When the patient has a weak constitution, or if the teeth are badly formed, (as to their composition in structure), they are undoubtedly improved by extract-

ing the sixth year molars. The formative and sustaining organs, (the dental arteries, veins and nerves), are certainly made more vigorous by taking away about (5-27) five-twenty-sevenths of the teeth depending upon them.

In exhibit "Model A" the patient, male, age 17, the inferior sixth year molars were extracted December, 1890, and the superior sixth year molars were extracted December, 1891. You will notice that the spaces in the inferior maxilla made by extracting the sixth year molars have entirely closed, that the other teeth are well set in the arch, just touching on proximal cutting edges, and that there is good space in maxilla for development and eruption of the wisdom teeth. In the superior maxilla where the extractions were a year later, the spaces are about two-thirds closed, and will in time be nearly as well arranged for other teeth as in the inferior maxilla.

Exhibit Model "B": patient, female; thirteen years old next May. Her teeth were crowded and soft. The superior bicuspid have fissure decays. The right inferior second bicuspid was decayed when erupted, brought about by a febrile condition during the forming of the tooth substance. After studying the entire mouth or maxillas, I thought it best to extract the four sixth year molars, which I did last March. In the inferior maxilla the right 12th year molar is entirely erupted, the left 12th year molar is beginning to show through the gum; the bicuspid are spaced, and in a few years I expect to have a fine arrangement of the inferior teeth. The superior maxilla is much better. The bicuspid are well spaced; the right twelfth year molar is entirely out of the gum, the left twelfth year molar is just erupting and the space of the sixth year molars is entirely closed. The patient will surely have a better set of teeth than if the sixth year molars had been retained.

I am confident, that since the sixth year molars are first erupted, subject to all the influences of the changes taking place during the replacement of the temporary by the permanent teeth; and that as most arches are crowded,

that the sixth year molars ought to be extracted, for girls about the tenth year and for boys about the eleventh years. I submit as good evidence for their extraction exhibit model C: Patient, male; age, 25. Dr. Jack, his dentist, extracted the sixth year molars at the age of ten, the patient said, for the sole purpose of trying to give him a good and well arranged set of teeth. He also informs me that every member of his family except himself have bad teeth, and that in all the others the sixth year molars were left in the arch. You will see from the model that the teeth are well arranged, the wisdom well developed and of full service, and that they are good masticators. Dr. Jack, of Philadelphia, certainly did this gentleman a great favor by extracting his teeth, and as I said before we would confer equally as good favor on nine out of ten children by extracting (in time) their sixth year molars.

BRIDGE AND CROWN-WORK.

BY F. W. SCHLENDORN, D.D.S.

It is not my object to speak of a special method of crown and bridge-work, but of the numerous difficulties and inconveniences which are sometimes connected with it. When we consider the comfort and relief that the modern system of bridge-work brings to the patient, it is difficult to understand the prejudice which that branch of dental art has hitherto experienced, and, to some extent, still does experience. This is partly due undoubtedly to the conservative tendency of the profession, which is properly skeptical to all innovations not sanctioned by time, and partly perhaps to the bad results which only too often have been met with.

So that from being the depised sister of our dental art, she has blossomed under the care of skillful hands and now dressed in a more modern garb, has eclipsed

like the beautiful cinderella all her sisters in advance of the profession and forming the hand-maid in the art of every successful modern operator.

As I have remarked before, bridge-work has suffered considerably by opposition, and oftentimes have I heard from patients and my professional brothers that bridge-work is a failure, and which would scarcely maintain its own position in dental profession, as there are too many failures connected with it.

Gentlemen, whoever wishes to do bridge-work successfully, must have for his motto : A thorough knowledge of the work and a great deal of honesty !

It is an interesting question to consider where the greatest errors in bridge-work are committed. In adjusting and fitting of bands for crowns and roots, and the preparing of teeth, which are to be used for the attachment of the work, we should never, under any circumstances, do the work after a (plaster of paris) model, which I am sorry to say is sometimes done. It is a matter of impossibility to do this correctly, even if the model has been trimmed and prepared by a master-hand. The band will either go too far under the free margin of the gum, or not enough, or it is too wide, and will press too tight on the gums and these committed faults will either produce inflammation of the gum, or the ruin of a tooth, which is oftentimes the case.

Herewith I will relate a few cases, which came to me :

I will tell of a case, which came to me two years ago, and which will show you that bridge-work, when not properly done, will be a failure, after wearing it for a few weeks.

The general appearance of the mechanical work was quite nice, but when I took my excavator I found I could push my instrument about 1-16 of an inch under each cap, and found the caps entirely free of cement, which I judge was due to the improper fitting of the caps and cementing of the work. At some places the work did not reach, and on others they extended entirely over the gums.

Here, gentlemen, is a case, where patient and dentist will condemn bridge-work! The patient requested to have the work done over, as she was going to leave the city and did not feel satisfied with it. After removing the bridge-work, I found the twelfth year molar and first bicuspid in lower jaw filled with amalgam. I removed both fillings, which I always do with old fillings, to see if the cavities are in proper condition. But in these I found that they had not been properly cleaned, and decay was going on, and in a short time the teeth would have been abscessed from a dead nerve. I treated and refilled those teeth, then made proper bands and crowns to fit, and replaced the bridge-work.

Another case, which seemed to be perfectly harmless to the dentist, but which produced a great deal of trouble to the patient, came to me a few months ago. The work was done a year ago, the patient suffered with inflamed and sometimes severely swollen gum; the work was attached to both eye teeth with Dr. Evans' gold crowns. By examining the troublesome place, I found that the dentist had taken a plier and pressed the cap of a crown together to make it smaller, and this produced an elevated point under the gum, from which the irritation was produced. To overcome this trouble, I exposed the place by pressing cotton under the gum, then cutting down the point with a corundum and then burnishing it. In this case I would call to your attention, that dentists who do bridge and crown-work should be particularly careful in burnishing and polishing the bands, which go under the free margin of the gums.

And it is true there are cases, in which the work turns out beautifully in every respect, where we are delightfully conscious that all is in good order and must necessarily crown our effort with success!

Yet after all, after a year or two, the patient returns to the dentist's office, and the dentist can generally observe by the dissatisfied look of the patient that something is

wrong, which proves either that a facing has been cracked, or a crown split, or, which is still worse, the shaking of the bridge-work, on account of the roots becoming loose!

Now what to do? Now is the time for the dentist to bring his ingenuity in play, to alter the difficulty, so that his patient can leave his office with satisfactory results.

A patient came to me wearing a bridge-work on both sides of upper jaw, from the first bicuspid to twelfth year molar (inclusive). This work was one, which in all respects was perfectly and beautifully done, but yet was about to lose its durability, as the teeth upon which the work was fastened became loose! The patient still possessed her six front teeth, and to accomplish my ideas, had to sacrifice both eye teeth. The patient, a very intelligent lady, was entirely satisfied, as I explained to her that this was the only way to repair the work. To start with I removed the bridge-work, then cut off both eye teeth, prepared a cap with a cylinder, fitted over the root, then I replaced the bridge-work temporarily and united the bridge-work on cap together with wax, invested it in plaster of Paris and soldered, then cemented both parts of bridge-work. Now I swedged a cap over the other, which was soldered to the bridge-work, filed a pivot of gold iridium which was cleft, and fitted exactly into the cylinder. The cap and pivot were then soldered together and fixed upon the eye-tooth cap. Then I took the porcelain facing which was backed with gold, fastened it to the cap and pivot, and soldered both parts together. Then I set the eye-teeth into their position, took a plaster impression (of the front part of the mouth) and formed from this a zinc model, then swedged upon it a gold plate, which was soldered to both eye-teeth and combined them. This completed the work.

Another case, where the cap over a twelfth year molar of a full upper bridge-work was split on the buccal surface. To remove the work would have given a great deal of trouble, and have been very expensive to the patient. My

object was to repair the work in the mouth. To start with I took an impression of the split surface, then made a zinc die from the impression and swedged a small gold plate to cover the side of the split crown. I next drilled four holes through the plate, cap and enamel of the tooth; then made four platina iridium screws, cemented the plate to the split crown and fastened it with the screws to the cap and tooth. This work has been done nearly a year and a half, and has given entire satisfaction.

A similar case is to repair a broken facing, which you all perhaps have had occasion to do, and to repair it in such a way that no one can discover it to be a repaired case. I take an impression of the backing of the broken face, then make plaster model of the impression, grind the facing to the model, so that it will fit perfectly, then cover back of facing with a piece of paper, as making a gold backing, put the paper on backing of broken face, and I find the exact place to drill the holes for the pins, then cement the facing in the place and rivet.

Gentlemen, I have now finished in regard to bridge-work, but would with your kind attention make a few remarks in regard to an artificial superior maxillary of the left side, a case which I did some eight years ago in Europe. The patient, a gentleman, about 29 years of age, lost the left side of the superior maxillary by an operation. To replace the deficiency, I had taken an impression with modeling composition and from this impression made a rubber plate to cover the roof of the mouth and extend over the lost surface of the plate. I then built up with gutta percha the lost superior maxillary to get the exact shape. I next invested this in flask, then removed the gutta percha, packed the same with rubber, and vulcanized; to overcome the heavy weight I made the case hollow. To keep this plate and work in position, I cemented a gold crown which I made square shape over the twelfth year molar in lower jaw left side, then made another crown to fit over the first one, and to this crown

attached a gold spring, which fastened to the work and in this way kept it in position.

DISCUSSION.

Dr. Bonwill.—Against general bridge-work such as I usually see I am opposed. The most of what I have seen is apparently worthless. I have seen so much mutilation from this cause. It is a good thing in itself, but it has been carried too far. In the majority of cases, which I have seen, it has been the cause of irritation and deposit, and the root has gone in spite of it. I am in favor of removable bridge-work. Simply resting it on the gum and having little anchorages on the teeth. I would not object to putting a filling into a tooth and anchoring to the filling. Last year I showed you a plan of removable bridges. I am against permanent work in a majority of cases. I don't say that such work should never be done, but that a great deal of judgment should be exercised in doing it. Only a few men are capable of doing it.

Dr. B. Holly Smith.—Much injustice has been done to the so-called bridge-work by an improper selection of cases. Some have undertaken bridge-work when it should never have been done. From this has come its condemnation. Under proper circumstances bridge-work is a God-send. I question the propriety of cushioning the gum to retain particles of food and secretions. It is impossible to keep out these secretions. I never removed a saddle in my life where the gum was not inflamed and in anything else than a healthy state. I propose to criticise or oppose any appliance which has a cushion resting on the gum. I have never seen a case where it did not bring trouble. In regard to the necessity of preparing the work in the mouth my plan is not to make the bridges on the teeth themselves. I first take an impression and send it to the laboratory where I have a skilled man who makes the crown. He sends me the band and I see that it is perfectly fitted marking any corrections, which need to be

made. I return it to him, and he cuts it as I direct. I don't think the band can be as well fitted on the teeth as having it done in the laboratory. I prefer to fit a collar on a cuspid tooth in the mouth. I have never seen cement which would stand in all mouths. I tell a patient in whose mouth I cement bridge-work to come to me again in three months.

I think if we are careful there is no reason for the wholesale condemnation of bridge-work.

Dr. Genese.—Tin-foil has been mentioned as useful in getting a pattern of the teeth. Tin is a brittle substance. If you take lead foil you will find it much better. If you try it, you will be surprised how nearly perfect you can make your work fit."

ARTICLE II.

E. PARMLY BROWN'S PORCELAIN BRIDGE- AND-CROWN-WORK.

It is not a question as to whether a permanently attached denture to restore lost teeth is the proper thing or not. That has passed. The question now is, what kind of bridge and what kind of crown is the best for the case at hand?

The fact that most dentists are not inserting bridge dentures, is no proof that a large majority would not be practicing the art if they could.

The broad-minded practitioner diagnoses his cases and selects from a large assortment of methods the best treatment of each; the man of one idea always has gold for filling, or, if never gold, amalgam, or always gutta-percha, or always cements.

The same may be said of bridge-and-crown-work.

The bridge-worker who always cuts off his pier teeth

is circumscribed in his knowledge and usefulness in the art. Ten cases pass him by unattended to where he operates on one; lacking, as he does, the hardihood to attempt the destruction of good teeth for piers, or failing to get the consent of the patient to attempt such a rash proceeding. The reasons are obvious to bridge-workers; a few cases of denuding fairly good teeth of their enamel, with pulps alive, to make ready for their capping; or amputating such teeth for piers for bridges, satisfy the operator, and he shrinks from any more of that kind of work, which brings more curses than compliments from the patients.

The practice of inserting from one to four or five teeth into gold or amalgam filling attachments will broaden the field of usefulness of the operator.

To say that you have seen failures of fillings holding bridges in place for any great length of time, as an argument against the system, has the same weight as the assertion that you have seen fillings fail, as argument against the wisdom of filling teeth.

I recently extracted a very loose left upper central, from the mouth of a clergyman in New York, in the presence of another dentist, on account of root absorption, which the living central had attached to it and the living cuspid, anchored into gold fillings, a lateral incisor bridge, a porcelain gum plate tooth with soldered gold backing and cross-bar; this bridge had been in its place without repair for eighteen years, having been inserted in 1874 in Salt Lake City, by Dr. Calder.

With modern solid gold and improved gold alloy fillings, and most cases more favorable for good attachment than this presented, who can longer have doubts of the great possibilities of the future in this line.

The fact that your essayist has inserted over a thousand bridges mostly by filling attachment, many of them having been in about eight years, and most of them being under his inspection, accounts for his faith in the practice.

The beginner who, with doubts and misgivings, fails

in his attempts, does not prove that one cannot succeed who has become expert by years of study and practice.

Ten years experimenting with porcelain for crowns and bridges has made me a firmer believer than ever in porcelain for most cases; very often using gold crowns for single teeth or roots, or piers for bridges where not in sight, and once in a great while a gold bridge where indicated.

The improved porcelain bridge should rest firmly on the ridge, the surface in contact with which is constructed with a platino-irridium swaged plate, the cross bar and tooth or teeth being first soldered to the plate with pure gold as in continuous gum work; a moderate amount of tooth body first applied, and baked, then full contour obtained at the second baking, gum enamel to finish if necessary, at lower heat, at which baking any small crevices could be filled in with English body, which fuses at about same heat as American gum.

Soft platina caps for ends of roots, either for single crowns or bridge piers (as designed by me), where caps are indicated, made by fitting band, soldered with pure gold, and cut into slits as far as the end of the root, then this aggregation of points is burnished or pressed, one at a time, on to the end of the root, taking its exact form, however irregular; the pin is then pressed to its place, waxed, invested, and soldered with pure gold, unless a porcelain crown is being used with pins, then soldering is not imperative, baking without soldering being sufficient.

The porcelain denture when completed is as cleanly as the natural teeth. It is nearer to nature in form and appearance than any work I know of, and I am satisfied that in the near future, when the facilities for doing the work are to be had, and dentists become conversant with the art, that it will be a delight to patient and operator as well as a profit to both in every way.

The difficulty of the work will tend to increase fees; for that which is easy to do most anybody can do, without

much study or effort, and therefore will be done cheaply.

If I could not have porcelain bridges I would be putting in good bridges made on swaged platino-iridium, fitting close to gum or ridge, teeth backed with platina, caps made of platina bars of platino-iridium, square wire, all soldered with pure gold, cap crowns made also of platina and pure gold flowed on them for appearance.

The contour of this structure to be restored as much as practicable to natural form. This would have some of the points of perfection of the porcelain work, lacking mainly an artistic appearance, lacking some in natural contour, some in strength, some in cleanliness, and much in economy of metal and labor. Six points of advantage claimed by the porcelain work over the metal work described, which has the advantage of the ordinary gold bridge that does not rest firmly on the gum, in several respects, principally in the additional support obtained by so resting.

These gold bridges I would insert as I do now the porcelain bridges, mainly with filling attachments, some cemented to root piers, and some to cap crowns.

The question of solid gold fillings to anchor bars, extending from bridges into cavities in pier teeth, is solved by using the Bonwill electric mallet with current from the Edison circuit if possible, if not a strong battery, or the next best force to thoroughly condense the gold.

The tooth to be braced at first by heavy retaining instrument held in left hand till the filling is anchored, then the tooth should be braced by an appliance devised by me, which I have used for several years, made of a bar of tin pointed and curved properly to hold against the tooth malleted on, held either by left hand of operator or by an assistant, which bar is suspended by cord and counterbalance from above, or can be held in hand only.

This metal bar takes nearly all the force used in condensing, and holds the tooth rigid to make the force applied more effective.

The necessity of solid gold fillings to anchor bridges, brings the operator up to a higher standard of well-anchored and solid gold fillings for all his work.—*Review.*

ARTICLE III.

CAUSES OF PAIN REFERRED TO THE TEETH.

It is not of infrequent occurrence for a patient to come complaining of toothache; in the majority of cases, from one's records, or from unmistakable symptoms, it is made evident, in a very short time, just where the trouble is. Occasionally, however, the diagnosis becomes extremely difficult, and one has to consider all the causes of pain, and reach his diagnosis through elimination.

SURFACE SENSITIVENESS.

One writer says, "In very rare instances an apparently sound and healthy tooth will become the seat of severe and continuous pain, which, for the time, resists amelioration from the application of any of the remedies usually employed. Generally, however, such a tooth, if the intensity of the pain does not necessitate its removal, will be found within a limited period to be responsive to local irritants, such as sweet, sour, hot, or cold articles, when brought into contact with some circumscribed part upon the crown, the response manifesting itself as acute but temporary pain. The cause of this morbid condition is but imperfectly understood, and its pathological significance is only fully appreciated when the sensitive surface yields to some destructive agent, resulting in molecular disintegration or caries." Such a spot upon the crown of a tooth must, as this author says, be very rare; but it is by no means uncommon for spots upon the roots of teeth, when there has been more or less recession of the gums, to become thus

sensitive, and responsive to a painful degree to the sort of irritation just mentioned. Especially is this liable to occur when the relation of adjoining teeth is such that food is allowed to crowd up between the teeth, where, by its macerating effect and by the action of the acids formed in its fermentation, it brings about this hypersensitiveness of the surface. That this is the cause is proven by the fact that the sensitiveness disappears when, owing to the presence of approximal cavities, it is possible so to contour the teeth that food shall not be wedged up between them. Pain due to this cause is pretty definitely located by the patient, and responds to the point of the examining instrument. That there is no depression or roughness of the surface shows that the condition is not the one next to be mentioned.

CARIES.

Caries, though superficial, may be accompanied by pain wholly out of proportion to the loss of tooth substance. If caries is the cause of pain, in a given case, it is made evident by the unusual sensitiveness of the spot to the blade of the excavator, as well as by the history of pain in the region after eating sweets and acids.

That the pain from this cause may be distressing and continuous, I can myself bear witness. While eating sweets, I began to feel a pain in an upper wisdom tooth, which had never given me any trouble. The pain, soon becoming excruciating, lasted an hour. There was no question in my mind but that the pulp was exposed. Examination, however, showed that the caries—was very superficial indeed.

HYPERÆMIA AND INFLAMMATION OF THE PULP.

When one considers how narrow is the line between hyperæmia and inflammation (in the one case a congestion of the capillaries of the pulp; in the other, the same condition with the migration of the corpuscle and the exud-

ation of lymph added), it is found that the diagnosis between the two conditions (hyperæmia and inflammation) is difficult or impossible. That it is necessary to distinguish between the two conditions is owing to the fact that, if the case be one of simple hyperæmia, there may be a good chance of saving the pulp by improving the conditions of the tooth.

Hyperæmia may occur in a tooth apparently sound; more frequently it is found in one in which there is a cavity of considerable depth, or a filling of large size, thus subjecting the pulp to changes of heat and cold. The pain of these two conditions is, pretty generally, definitely located by the patient.

In hyperæmia, the pain is paroxysmal, of a lancinating, excruciating character, and is usually induced by thermal changes. In the intervals between the paroxysms there may be complete cessation of pain.

The same symptoms hold for inflammation of the pulp except that the pain is not as severe, as a rule, and is more continuous. The pulp does not respond quite as readily to heat and cold.

A convenient and effective way of testing a tooth, to see whether it is responsive to thermal changes, may be mentioned here. A piece of ice, to give a satisfactory result, needs to be small enough to cover but one tooth. When thus small, it is hard to handle, melting before the cold has had time to penetrate the walls of the thicker teeth. On the other hand, heat from an ordinary instrument, as, for example, the ball burnisher, is dissipated too quickly to afford a conclusive test. When an Evans root-dryer is kept in the bunsen flame till the bulb is red-hot, enough heat is liberated at the tip of the silver point to scorch the fingers as it is quickly drawn over them. Moreover, the heat is kept up to this high point for some little time. If there is any pulp alive in a tooth in question, the tip is pretty sure to find it out. This can be applied, too, at the thinnest part—the neck—without danger of burning the gum.

PERICEMENTITIS.

The prominent symptoms of all inflammation of the pericementum is tenderness on percussion and on movement of the tooth. Pain varies according to the cause of the trouble takes its origin from the margin of the gum, or from the apex of the root.

A wedge pressing upon the gum, or the presence of fermenting food in a space between two teeth not easily reached, or a deposit of tartar, may set up a pericementitis. There is some lameness of the teeth involved. The pain, in most instances, amounts to nothing more than a "grumbling." When the trouble is at the apex of the root, however, from extension or inflammation of the pulp, or from the ingress of septic material through the empty canal, the pain, at first dull, soon becomes severe, throbbing, and unendurable. There is great tenderness on percussion, together with a lifting of the tooth in its socket. Heat does not aggravate, unless after long application, and then to a moderate degree. Cold, on the other hand, brings relief.

An interesting point to be mentioned here is, that in teeth with more than one root, a pericementitis may be set up on one root at its apex, while another root is still alive. Forgetting this, it would be very confusing to drill into a tooth which gave all the signs of pericementitis, and find the tooth sensitive:

NODULAR DENTINE OR PULP-STONES.

This condition is by no means uncommon. The diagnosis, as there are no distinctive symptoms, is not easy, and must be reached by exclusion. The pain is neuralgic in character, and, at first, is not apt to be attributed to the teeth. If attention is called to them, there will probably be found a slight tenderness on percussion in the tooth which is the seat of the trouble. The neuralgic pains are paroxysmal, there being pretty complete relief from pain during the intervals.

HYPERCEMENTOSIS.

What has been said concerning nodular dentine applies almost word for word to hypercementosis. Pain, if associated with the teeth, is neuralgic in character. The affection is much more rare, however, than nodular dentine, or, at all events, its presence is discovered less frequently by the practitioner.

UNERUPTED OR IMPACTED TEETH.

Such teeth may be the cause of mysterious toothache. In rare cases, inflammation of the pulp and pericementum may be set up in unerupted teeth. Impacted inflamed wisdom teeth, from their position, pressed down upon the nerve-trunk, are very liable to give rise to severe toothache, with neuralgia, trismus, and ankylosis.

INFLAMMATION OF THE ANTRUM.

Inflammation of the mucous membrane of the antrum when connected with the teeth, as regards the etiology, or as far as the symptoms are concerned, is due, in most instances, to an extension of an inflammation of the pericementum of some of the teeth which not infrequently extends into that cavity. Occasionally, however, as Garretson mentions in his "System of Oral Surgery," a purulent inflammation of the membrane which, in its origin, is independent of the teeth may be characterized by neuralgic pains, with a localization in the bicuspid or molar teeth.

A case of antral abscess I have in mind was as follows: The patient complained of agonizing pain in the left upper second bicuspid, in which there was a small distal cavity filled with gutta-percha. The filling was removed. Being found in good condition, the cavity was refilled. It was concluded that the case was one of simple hyperæmia, and, after the application of iodine to the gum, the patient was dismissed, with the hope that the pain would become quiet.

The pain continuing, relief being demanded, the pulp was devitalized, removed, and an antiseptic dressing left

in the root. No relief coming from this procedure, a drill was put into the antrum, giving vent to the pus confined there.

At the outset there are no diagnostic points of this affection, unless earache and ringing in the ears (which are pretty constant symptoms) be mentioned. Later, when pus has formed, there is a feeling as of the running of water when the head is moved from side to side, together with the escape of pus into the nostril of the affected side.

REFLEX TOOTHACHE.

In a case of toothache for which it is difficult to find a cause, the possibility of its being a reflex expression of trouble in some other part of the body, or in some other tooth, must not be forgotten.

As an illustration of the very common reflex toothache of the superior second bicuspid when the inferior wisdom-tooth is at fault, and as an example of the fact that one should never rely upon "subjective" symptoms nor be deceived by appearances in making a diagnosis, the following case is given :

A patient came to me, saying that her teeth had recently been examined by her dentist, who had pronounced their condition good. She had been suffering from pain in the right superior second bicuspid, the pulp of which she thought had been capped. As the filling—a soft gutta-percha—was leaky, it was removed. The cavity was very deep, and in most cases, there would have been an exposure of the pulp, but there had evidently been a recession of the pulp, with the deposit of secondary dentine. As the floor of the cavity was hard, and the smallest probe could find no opening into the pulp-chamber, it was determined to fill again, putting an antiseptic dressing at the bottom, gutta-percha and cement on that. All went well for a month, when the patient returned, saying that the pain was worse than before. An exposure of the pulp was

made. The pulp was paralyzed with cocaine, removed, and the roots filled with gutta-percha. The patient was dismissed with the assurance that her pain was at an end. She returned in a few days, saying that she had been in agony. Here was a disappointment for me, a believer in root filling, for in this case all the conditions had been favorable. Percussion, however, showed that the bicuspid was absolutely without tenderness.

Examination of the lower wisdom-tooth revealed a cavity. This was excavated and dressed, and there was an end of the pain.

Pain may be reflected from more distant starting-points. Slight operations in the nasal passages, such as the removal of adenoid growths and the cauterization of hypertrophied mucous membrane, covering the turbinated bones, may be followed by toothache. Diseases of the eye and ear, of the stomach, of the uterus, and the condition of pregnancy may be accompanied by pain in the teeth.

A case which may be mentioned here as illustrating how the sensation of pain may be reflected from its proper source was seen by me a few days ago.

The patient, a woman, began to be troubled five years ago by neuralgia in different parts of the distribution of the trifacial. The teeth, however, had never been the seat of pain. During all that time she had been under treatment, free from pain, except under the influence of analgesics. The pain having become localized in her ear, she was sent to an aurist. He, finding no trouble, sent her to a neurologist, who, after a careful examination, told her that the only thing to do before availing herself of the last resort (excision of a portion of the nerve) was to consult a dentist. He brought her to Dr. Hamilton, who finding an exposure of the pulp in a lower third molar, ordered the tooth extracted. In his absence I saw the patient, when, two days later, she came to report. For the first time in five years, she said, she had been entirely free from

pain. She left, filled not with a spirit of thankfulness that her sufferings were over, but with a desire for vengeance upon the men who had kept her under treatment so long, when the trouble was all due to a wisdom tooth.

In cerebral diseases and hysteria, a patient may complain of toothache when the teeth are in no way at fault.—BRIGGS (C. P.), *International Dental Journal*.

ARTICLE IV.

ROOT CANALS.

If any dentist will go to the box which contains the teeth that he has extracted, and will make a careful study of their contours, he will at once see that there is a wide difference in the conformation of the crowns, and that the pulp chambers present as great a diversity in shape and size. He may also discover another fact, and that is that the entrance to the root canals is from all points of the compass, and presents all the modifications from a great round hole to the narrowest slit imaginable, while the canals themselves will be found ramifying in almost all directions. And yet, many seem to act upon the impression that all that is necessary to prepare a root for filling, is with a bur or drill to sink a shaft straight down into the tooth almost anywhere, and in some way it will find the root canal.

Of course, these remarks are mainly applicable to attempts made in bicuspid and molars, but to some extent it is true of the anterior teeth. It is very easy in attempting to drill out the canal of an incisor, or in enlarging it for the insertion of a pivot, to break through somewhere at the side. It is not always possible to determine by external appearances in just what direction a root extends.

There may be a deflection just at the cervical portion, and the crown may be set at an angle to the axis. Sometimes, too, the root is not straight, but at a point between the crown and apex there is a curvature. Nor can this always be determined by probing with a flexible broach. Extreme care is, therefore, often necessary, in any attempt at enlargement of the canals, even in front teeth.

But if this be the case with single roots, what shall be said of irregular shaped bicuspid and molars? Sometimes in the latter the crown is exceedingly short, and the pulp chamber shallow, so that opening or enlargement of the latter with a bur is done at the peril of breaking into the septum between the roots. This, of course, is usually fatal to any attempt at their proper treatment and filling. Every effort to reach the canals is attended with the liability to enter the opening to the pericementum and alveolus, with the consequent influx of blood and serum, and the probability of the formation of a new point of infection.

The palatal root of a superior molar usually approaches in shape that of an incisor, and the canal is almost as readily found and entered. But occasionally it seems to be at one cornua of the pulp, and again nearer the other, and it requires considerable patient search before it can be exactly located. An engine bur is a very poor instrument to look for it with, because it gives no intimation of the fact when it is found, while it is quite likely to go just where it is not wanted.

The posterior buccal root is yet more difficult to locate, and when found is hard to penetrate, while not infrequently it is absolutely impossible to thrust the finest broach for any distance into the anterior buccal root, or to enlarge it without extreme danger of opening through it at the sides. Sometimes the opening to the posterior root seems on a line with that of the palatal, and again it is the anterior one. Occasionally they all seem to diverge from near the same point, and unfortunately the contour of the crown gives little indication of what is the exact condition.

In lower molars, the posterior canal is usually easily located, but it is hard to determine its shape. The root may be wide and flat, with a thin, constricted portion in the center, and there may be an opening into each thickened border, while the central portion may be almost or entirely closed. Only the most careful examination will determine what is the exact condition.

The pulp canal of the anterior root of lower molars is the most aggravating of all. If, as is frequently the case, the cavity of decay is upon the posterior border of the crown, it is almost impossible, without cutting nearly through the tooth, to find the narrow slit that is too often all there is of it. The root, too, is frequently curved and very thin, while what of opening there is seems to exist at the very anterior edge of the crown. It is usually quite impossible to clean out such a root, and dependence can only be placed upon sloughing of the contents, the thorough asepticising of the canal by absorption of the medicament, and the final filling of it as well as one can, with a thin, plastic material. This method, of course, means treatment for a greater or less period of time.

Inferior bicuspid usually have but a single canal to fill, although this may be a wide but thin slit. There is commonly little difficulty in locating it, although the first bicuspid is more apt to give trouble than the second.

Superior bicuspid are more easily reached than the molars. The first sometimes has two canal openings, that may be readily entered, while in other cases there seems to be but one. The pulp chamber, too, is at times irregular in shape, the canals tortuous and with constricted portions. Not infrequently such a narrowing will be found about three-fourths of the way up, having passed which there seems to be a kind of enlargement between that point and the apex, which it is extremely difficult thoroughly to clean out, or successfully to fill. Yet the continued success of the operation very largely depends upon perfect work at this point.

Complete access to any root canal depends upon getting the mouth of it well open. If the entrance is at an angle to the axis of the root, there will be an overhanging edge of dentine, partially blocking the opening, and if the inclination points forward this ledge must be removed before any thorough work can be done. It is just at this point that the danger arises, especially in molars, for if the root be thin, there is danger of perforating it. In many lower molars the septum of bone is thick, the bifurcation extends well up to the crown, and but a very thin layer of dentine and cementum separates the pulp chamber from this bony septum between the roots.

If a bur be used to remove the dentine at such canal openings, there is great danger that it will penetrate through and the tooth be ruined. Even though the pericementum be not reached, if the cementum be injured serious consequences may ensue. It should be remembered that this is living tissue, and is in relation with the pericementum. It cannot be devitalized like the dentine, without the loss of the tooth. Irritation of the cementum corpuscles may extend to the investing membrane and thus induce a pericementitis that will make extraction necessary. There is little doubt that many teeth have thus been lost through injury to the cementum, when the exact cause could not be determined.

From all these considerations, then, we deduce the conclusion that a bur is a very dangerous thing to introduce into a pulp chamber. If it be necessary to enlarge the opening into a canal, the excavator is the only safe instrument, for it is comparatively easy to know what progress has been made with it, and the advance is slower. The bur buries itself in its own debris, so that its exact position cannot be definitely determined, while the tremulousness of the handpiece is fatal to all delicacy of touch.

But with the greatest care in searching for root canals, and with the utmost pains in the attempt to enter them, there will

still remain a percentage that must remain unfilled. They are so minute, perhaps, that the most delicate instruments cannot be introduced, or they are so tortuous that it is impossible to follow them to the apex. If sufficient time be given for the sloughing of their contents, and if antiseptics be allowed to remain until they shall have thoroughly penetrated them by absorption, they may, probably, safely be left to nature's care. But if one would know how best to obtain access to root canals, he must do what we urged at the commencement of this article—study well the forms of extracted teeth.—*Editorial Dent. Pract. and Advertiser.*

Editorial, Etc.

DISTRICT OF COLUMBIA DENTAL LAW.—At the meeting of the Maryland State Dental Association in May, Dr. H. B. Noble, of Washington, D. C., in his paper on "Dental Legislation," expressed the hope that before the present session of Congress had passed, a dental law would be enacted for the District of Columbia. His expectations were realized.

The act passed by Congress and approved June 6, 1892 for the regulation of the practice of dentistry in the District of Columbia provides that it shall be unlawful for any person to practice dentistry in the District of Columbia unless such person shall register with the health officer in compliance with the requirements herein-after provided:

That a board of dental examiners, to consist of five reputable dentists resident of and for three years last before appointment actively engaged in the practice of dentistry in the District of Columbia, is to be appointed by the commissioners of the District for terms of five years and until their successors are appointed; provided, that the first five appointments shall be made for terms of one, two, three, four and five years, respectively. A majority of said board shall constitute a quorum. Vacancies occurring in said board shall be filled by appointment of eligible persons for unexpired terms.

That it shall be the duty of the board of dental examiners to test the fitness and pass upon the qualification of persons desiring to commence the practice of dentistry in said District after the passage of this act and certify to the health officer for registration such as prove, under examination in theory and practice of dentistry, qualified in the judgment of the board to practice dentistry in said District. Provided, that all graduates of dental colleges which require a three years' course of study shall be entitled to certificates upon payment of the certification fee and without examination as to their qualifications.

That it shall be the duty of every person practicing dentistry in said District at the time of the passage of this act to make application to said board, in form prescribed by said board, for certification, and present the certificates thus obtained for registration to the health officer within sixty days from the passage of this act. Every such person so registering may continue to practice without incurring the penalties of this act.

That any one who shall practice or attempt to practice dentistry in the said District without having complied with the provisions of this act shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be fined not less than \$50 nor more than \$200, and in default of payment of such fine shall be imprisoned not less than thirty nor more than ninety days, said fines, when collected, to be paid into the treasury of the United States to the credit of the District of Columbia; provided, that nothing in this act shall be construed to interfere with physicians in the discharge of their professional duties, nor with students pursuing a regular uninterrupted dental college course or in bona fide pupilage with a registered dentist.

That to provide a fund to carry out and enforce the provisions of this act the board of dental examiners may charge such fees, not exceeding \$1 for each certificate and \$10 for each examination, as will from time to time, in the opinion of said board, approved by said commissioners, be necessary. From such fund all expenses shall be paid by the board; provided, that such expenses shall in no case exceed the balance of receipts.

Monthly Summary.

THE NEWEST DISINFECTANTS FOR ROOT CANALS.—By Dr. All. Bandmann, of Berlin.—Extract from a lecture before the "American Dental Club, of Berlin."—As you are aware the aniline coloring substances have been repeatedly and successfully used in medicine as disinfectants for about two years. I have used two of these substances in my practice for several months, and have found them successful.

The coloring matters, of which I shall treat, are pyoctanin and methylen-blue, especially in their nature as antiseptics. I have used them in three different applications, *viz.*, first, fistula; second, decayed pulp; and third, alveolar necrose. I have first employed the pyoctanin, but then turned to methylen-blue, for I have achieved with the latter far quicker results.

In fistula, I have used the following method: After having secured a good, wide entrance to the root canal, I have injected, by means of a syringe, a drop of methylen-blue, having before surrounded the tooth with cotton rolls, for the methylen-blue colors very intensely, and then tightly closed the cavity with a large cotton stopper.

For decayed pulp, I have used the methylen blue as a disinfectant, by dropping cotton in a solution of methylen blue, and introducing it into the canal by means of a probe, then closing, as above. Lately, I have dipped the cotton also in methylen-blue powder. By severe beating, all these particles of powder that have not become damp, fall away, and then I introduce the cotton. In this way, I have removed from the canal every odor in a considerable shorter time.

For the alveolar necrose I have first used methylen-blue, after removing the sequestrum and scrubbing away the disease germs. I was surprised to see in what short time the wound healed; but I am convinced that the alveolar necrose can be treated safely and rapidly from the very first stage with methylen-blue.—*Journal für Zahnheilkunde.*

THE MEDICAL LAW AS IT CONCERNS DOCTORS NOW PRACTICING.—The new law relates only to persons who shall after the date of its passage begin the practice of medicine within the State. In regard to any person who may have previously practiced in Maryland, it is silent. These persons occupy after its passage exactly the legal status which they occupied before. The new boards of examiners are not expected to indorse their claims as practitioners, nor to condemn them as in any way culpable. They are simply to ignore them, and to confine their attention to future practitioners.

Moreover, the new Boards of Examiners may not molest any person hereafter beginning practice in Maryland, unless they have before them reasonable proof that such persons have never, previous to the passage of the law, practiced medicine in any other of the United States.

It will appear, therefore, that considerable caution must be exercised in the arrest of practitioners who hail from other States. Many years will pass before the law will be of much use in keeping itinerant doctors out of Maryland.

A good beginning has, however, been made, and its beneficent influence in restraining young graduates of home colleges will immediately be felt—*Md. Med. Journal.*

ARISTOL.—Modern surgery has been fortunate in many of the newer agents it has added to its resources, and among these aristol must be cited as the most notable. It is difficult to realize, to-day, that previously to the discovery of aristol there was hardly a general laboratory in America or Europe in which experimenters were not constantly employed in seeking for a suitable substitute for iodoform, while it was hardly possible to keep up a medical journal without reading of some new (and always inadequate) method of masking the awful odor of that surgical abomination. Now we rarely meet with these recipes, and all surgeons know the value of aristol. Surgery waited long for this topical remedy, but its splendid

qualities redeemed its tardiness. The absence of offensive and toxic properties united in its healing qualities were fully sufficient of themselves to make a great reputation for aristol. But its value as a dressing was still more highly appreciated when it found that it would adhere closely to denuded surfaces and make an impervious coating over them. Ulcerated areas which had defied the classical applications quickly closed under the stimulating influence of aristol, and in many gynaecological cases in which iodoform was inadmissible aristol did the work promptly and effectually. In burns, scalds, bed-sores and as a dressing for blisters, aristol is the most eligible application, and it is indicated in all of the operations of minor surgery. It has been successfully used, also, in diseased conditions of the eye, ear and nose, while in rectal surgery it is recognized as having special value. In major operations its superiority over iodoform is specially marked on account of its freedom from toxic influences; and in abdominal surgery aristol has no superior. Dental surgeons, also, have given it their unqualified approval. Indeed, the range of aristol has become so widened that it is regarded rather as the superior of than a substitute for that once useful but malodorous remedy, iodoform.—*Md. Medical Journal*.

ARREST AND TRIAL OF A TRAVELING MEDICAL MAN.—

Considerable interest was excited by the case of the State of Maryland vs. Charles McKay, alias Oregon Charley, which took up the better part of Friday, June 17th, in its trial before Justice Bitner.

The traverser in the case has for some time past had a tent pitched in the neighboreood of Locust and Bethel Streets, in this city, where he has been consulted by many persons for relief from various bodily troubles and ailments, has given them advice, furnished medicine, etc. He appeared to be doing well and to be giving general satisfaction to those that consulted with him and followed his advice.

Friday he was brought before the Justice charged with practicing medicine in violation of the laws of the State.

The law under which he was accused and tried was passed at the last session of the Maryland Legislature and has not yet been published in book form, the only evidence of the law being a written copy certified to by the Clerk of the Court of Appeals.

The law provides, under penalties ranging from fifty to two hundred dollars, that no one who is not now a practitioner of medicine shall be allowed to practice in this State, without possessing a diploma from some regular medical college, on obtaining a license to do so, either from the State Board of Regular physicians or the Board of Homœopathic physicians, which are the only two medical schools that are recognized under the new law.

Although the traverser had no such license to practice in Maryland, and produced no diploma from a medical college, yet there was no evidence to show that the traverser had not practiced medicine outside the State of Maryland, and as the law was entirely prospective in its operations and referred to those who were not practitioners at the time of its passage, the magistrate rendered a judgment of "not guilty."

If the party came to this State after the passage of the Act under which he had been arrested, yet even then, if he had been a practitioner of medicine in another State, the Constitution of the United States would protect him in the exercise of his profession here, as that instrument clearly prohibits any State from passing a law interfering with the rights and privileges of a citizen of any other State. It was incumbent upon the State to show that the traverser had not been a practitioner in the State from which he came, and this they had totally failed to do.—*Hagerstown Daily News*.

COURTS DIFFER IN REGARD TO INHALING GAS.—The United States Circuit Court for Illinois differs with the Court of Appeals of this State on the question of the liability of accident insurance companies for death by inhaling gas.

In a recent case in Chicago, a person was found dead at

a hotel with the gas turned on in the room. There was no visible sign of violence or external injury on the body, and nothing to show whether it was a case of suicide or an accident. The limbs and features were not distorted, and the victim was lying naturally on his side in bed. He held a policy of accident insurance in the Travelers' Insurance Co., which expressly relieved the company from all liability when death occurred by inhaling gas. The court held that the company need not pay the policy, and quoted the adverse opinion in a case in the New York Court of Appeals, where it was said: "In expressing the intention not to be liable for death from inhaling gas, can only be understood to mean a voluntary and intelligent act by the insured, and not an involuntary and unconscious act. Read in that sense and in the light of the context, these words may be interpreted as having reference to medical or surgical treatment in which *ex vi termini* would be included the dentists' work or a suicidal purpose."

The Illinois court comments on this decision and says: "The reasoning by which that court reached its conclusion is not satisfactory to my mind. The language of the policy is so clear as not to require any construction. The words are unequivocal that the defendant does not insure against death caused by inhaling gas.

There is nothing in the terms of the policy intimating or suggesting that the inhalation of gas must be voluntary or involuntary in order to exempt defendant from liability. That the defendant had the right to so limit its liability, there can be no doubt."—*Buffalo Med. and Surg. Journal*.

GOLD CROWNS.—Those who would put on a gold crown quickly and well may succeed by following these directions: Take a piece of thin wire (not too thin), and then, with a pair of pliers, twist it round the stump to be operated on, then slip it carefully off and paint it black; now take a piece of stick of some hard wood, something like a rivetting hammer

handle; selecting the stick according to the size of the band you require, put it in the vise now while the paint is wet on your shaped wire ring, describing the exact shape of the stump; place it on the top of the stick you have in the vise, and give it one sharp blow with the flat end of a good-sized hammer; take away your wire; now shape your piece of wood carefully and accurately, as the dark mark guides you, till the whole of the dark line disappears; mind you are inside the line, but do not go too far; now make a ferrule of coin gold for the top of your stick, polish and finish on the stick, then take it off and try it on the stump, and you find it a little too small to go on; take a sand-paper disk, and with the engine rough it all round and make it fit on "slick;" this being done, place your ferrule again on the stick, and make another ferrule to fit over it, as you would proceed to make a lid to a box. Now you have a telescope joint. Take off your second ferrule, or collar, and fix on the stump with osteophosphate, having arranged your gold crown to the articulation with strong wax, remove it, and solder your second collar on the crown, and polish; fill your gold crown with copper stopping, and then, as a lid fits on a box, your patient bites the crown into its place, and remove it if you can. In fitting porcelain teeth for the front, in this way, the great trouble will be in getting the pin in the proper position. Drill out the nerve canal, proceed as before, when you have your first collar on, fit your pivot *in situ*, and cut a small piece of platinum gauze the shape of the collar, and drop it inside, touching the pin; force in some resin wax, and bring out the gauze adhering to the pin; now set it in plaster and powdered pumice, and flush some solder over to fix the pin, then a piece of gold plate; having made your second collar, solder the gauze now filled in with plate, and solder to collar No. 2; on this arrange your porcelain tooth in the mouth, and solder it to second collar; your first collar now being fitted to the stump, press it all into place with good cement. A gold crown will be the result that is strong, substantial and durable.—*A. King in Ohio Journal.*

THE ODONTOBLASTS.—I cannot but think that the odontoblast is a rather hardly used cell; it has not only had to persist during the whole active life of the tooth, but has had to form the soft fibril, the investing tubule, and the matrix of dentine, and, in addition to all this, is considered by many to act as a nerve-ending cell, and conduct sensation to the dentine. This latter function is hardly, I think, consistent with its other offices, and with what we know of the action of cells in other parts of the body. This anomaly struck Mr. Hopewell Smith, in a paper on development, to which I have referred elsewhere, and he would rather consider the function of the odontoblast to be wholly sensory, the cell really being a nerve-end organ, and compared by him to the ganglion cells of the spinal cord, other cells than the odontoblasts being concerned in the formation of dentine. In this case, however, one would expect to find very considerable nerve filaments entering the odontoblasts, and it is also remarkable that in old teeth, the odontoblast layer appears to be absent. Professor Kolliker considers the growth of dentine to be partly by conversion and partly by secretion, and that while the central part of the cell persists as the fibril and tubule, the matrix is a secretion from the odontoblasts and other cells of the pulp. Baume holds that the calcification of the dentine takes place in a material secreted by the odontoblasts.—*Howard Mumery in British Journal.*

FOR THE TEETH.—Every substance which is pulverized in order to enter into the composition of a dentifrice should be powdered so extremely fine as to be mere dust. Thus pulverized, most substance likely to be used are harmless; but the best and safest basis for any tooth powder is prepared chalk and charcoal, one to three, the charcoal always to be kept tightly shut from the action of the air. Where there is bleeding of the gums, a little borax may be added where there is foulness, some cinchona bark: where whiteness is desired, some common salt. If a little rouge is added to disguise any portion of the powder not rinsed away, it is permissible; but it is better to make the rinsing thorough. Where the teeth are inclined to be loose in their settings, a wash of the tincture of myrrh is efficacious in fixing them more firmly. Many add to their pure chalk and

charcoal a trifle of powdered castile soap as a detergent, with camphor for sweetening the breath where there is decay; it being remembered, however, that camphor can only be reduced to powder by grinding it with a pestle after being lightly sprinkled with rectified spirits of wine. Meanwhile, without taking so much trouble, some pulverized orris root, where the teeth are not decaying will usually make the breath as sweet as the violets whose scent it imitates. A very pleasant and useful wash, where there are tender gums, is made by putting half an ounce of dried rose leaves to steep in a gill of boiling water, pressed and strained after three hours, and added to about six ounces of clarified honey, and evaporated for a few hours. This added, when used, to half as much water makes a valuable astringent wash and gargle. An excellent deodorizer is made by taking equal portions of ground coffee, chocolate and white sugar, with two-thirds as much pulverized charcoal and vanilla, added to just enough dissolved gum-tragacanth to make a stiff gum; bits of this kept in the mouth are said to make a bad breath pleasant.

Another breath-sweetener may be made at home by taking an ounce of extract of liquorice as thick as paste, a third as much powdered catechu, the same of powdered sugar, a sixth as much gum-tragacanth, a third of a fluid drachm of oil of cloves, half as much oil of cassia, and three drops each of oil of nutmeg and essence of ambergris, mixing well together, adding a trifle of rose-water and rolling the whole into tiny globules between the thumb and finger. Then if the little globules are laid on a leaf of silver, and another leaf is placed over them, the whole covered with a half sheet of paper, and rolled lightly beneath the flat open palm for half a minute, as fine and sweet silvered cachous will be the result as can be furnished by the best pharmacist. Take it all in all, care of the teeth *pays*, in comfort, in beauty, in the conservation of health from youth to old age.—*Harper's Weekly*.

DEVITALIZING PULPS.—Dr. Miller contributes to this number an excellent paper upon the devitalization of pulps. It will be seen that he depends upon cocaine for obtunding sensibility at the outset. His strictures upon the slovenly methods of many operators, who thrust in a preparation of arsenious acid and then proceed to ram it down upon the irritated pulp with a sandarac wad, are very just. His method of using zinc sulphate as a protective covering is new to us, and will commend itself to every dentist who values the comfort of his patients.—*Dent. Pract. and Advertiser*.

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ARTICLE I.

PLAIN TALK ON "FAILURES."

I do not care to discuss the question as to whether soft or cohesive gold should be used, hand or mallet pressure, all gold and no amalgam, beyond the statement that the dental practitioner who does not use all of them, as indicated, makes a deplorable failure and the practitioner who sees no good in a saved tooth, because its salvation was accomplished with a material other than gold, to my mind fails to comprehend his true mission in the profession he has chosen. I well remember cases in the earlier years of my own practice, whose ghosts haunt me now where failure of judgment, failure to use gutta-percha, oxy-chloride of zinc, or amalgam, cost my patient their natural organs and caused me the mortification of knowing that another failure was charged against me. Contour fillings of gold are good, and the theory that all teeth filled should be restored to their original pristine beauty in form, etc., *sounds* good certainly, especially as it is

sometimes elaborately described to us by gentlemen competent to talk upon such subjects. Still every one of you have seen the most outrageous failures from this source simply because the operator was proud of the fact that he could make a beautiful filling in a very frail tooth; deplorable failure in judgment as well as the service rendered.

Within a year I met a man and brother dentist who has been in practice counting his college experience not more than five years, who after some general conversation upon dental operations said: "I have seen some of your operations recently, made several years ago, and could not help criticising them." I asked in what respect; the reply was "you cut away too freely." I asked if the operations were saving the teeth? He replied, "Yes, I found only one which required a slight repair at the cervical margin." He then volunteered the information that in those bicuspid and molars where the dentine had been destroyed by disease, leaving the enamel standing, he tried to preserve that rather than cut it away, thereby exposing so much gold. My word for it, if this man continues in practice he will have some failures which will annoy him and cause his patients to speak after the manner of men, as forbidden in the fifth commandment.

Prof. Black has recently, in a series of articles in the *Cosmos*, given us advice upon the preparation of enamel edges, which if followed would save us many failures in this direction.

Another *growing* cause of failure, arises from the indiscriminate use of the dental engine and burs in the preparations of cavities for filling; I have seen so many instances where the cavity was the shape of a round bur, the enamel edges so thin that the most delicate manipulation with the finest instruments could not prevent their fracture, also in many localities it would be impossible to pack the gold into the undercuts so made. I have always feared the use of the bur in deep cavities, or in those

where it was dangerous to cut to any considerable depth, the hole being filled with the fine cuttings of the dentine, making it next to impossible to know what one is doing.

Recently two sisters applied to me for advice regarding their incisor teeth, which were considerably discolored, the usual tests convinced me that the pulps were dead. I removed some of the fillings verifying my diagnosis in this direction and finding the cavities formed as I have mentioned above, when burs were used. I commenced a course of questioning, which proved to me that these cavities were wholly prepared with burs, and that in each instance an exposure of the pulp was the result, consequently abscesses, discoloration and disfigurement.

A prominent dentist and careful operator in my office recently remarked "that some operators seemed to feel that they knew just where to look for a pulp canal and seemed to think that when necessary to open them for treatment, they could with a very fine drill and the engine, go through the crown and hit them every time;" his experience had been, however, that they as often went through the side of the root, through between the roots at the bifurcation, or at some other point, endangering the chances of saving the tooth. This is even a greater failure than those already mentioned, arising from too free use of the dental engine. Another dentist present a teacher, suggested that students should not be allowed the use of the engine during the first two years of their pupilage. Another, a Professor in one of our Dental Schools, not willing to go quite so far, was of the opinion that more attention should be given this subject in the education of dental students. I do not condemn the use of the engine, or burs; instead, I find them very valuable aids, but if we would avoid such failures as mentioned, we should use great care and discrimination when we do use them.

Another source of many failures I believe arises from the use of deeply serrated gold packing instruments. It can be readily understood, that where comparatively large

pellets are used, the long, sharp points pass entirely through, and not only fail to pack the gold against the walls of the cavity, but even pulverize them, leaving under the gold a layer of chips of dentine, thereby preventing the possibility of a moisture proof filling; and furthermore I have come to believe that much of the discoloration seen beneath thin walls, especially in incisor teeth, is due to the failure to remove all the dust produced by preparing the cavity.

Why do we speak of recurring decay about a filling of years standing as a failure, especially if that tooth has been filled with gold? Has this material properties in its pure metallic state which will prevent caries of the teeth? It is not antiseptic, and only answers the purpose best because it is soft and can be coaxed to remain in place when once fixed, if properly done; excluding moisture, particles of food and decomposable secretions which are always present in the mouth, the same conditions exist, the same tooth is composed of the same materials, weakened in its powers to resist diseased conditions now because of the disease infecting it years ago; to convey the idea to our patient that a tooth once filled with gold, is in the future safe from further disease, is one of our greatest failures as professional men. Did you ever hear of a physician assuring his patient that when he had once mastered the present attack, they would be exempt from similar ones in the future? That a bone once healed would never break again?

Is it not true that one has to grow old in practice, before he has the courage to say to his patron, "little of the work I do for you can be pronounced other than temporary, and in proportion as your teeth are now liable to caries will these operations require to be repeated;" here we fail in courage.—SWAIN (E. D.), *Dental Review*.

ARTICLE II.

A PRACTICAL CHEOPLASTIC PLATE.

BY C. W. STAPLES, D. D. S., LYNDON, VT.

No arguments are needed to convince you of the superiority of metal over rubber and celluloid as a base for artificial plate, and it is equally an established fact that tin has a beneficial influence upon mucous membrane as well as upon dentine.

That there has been some reason why each successive alloy of tin with methods of working has not been practiced in any considerable proportion of cases, has crowded such bases out of the position that they should occupy.

It is my purpose to present a method or rather a combination of methods (for which I claim no originality), by which a lower plate, either partial or full, can be constructed in about the same time as that required for rubber, and overcome some of the former objection to such cheoplastic plate and still retain the advantages of metal.

Such a plate must be made so as to accommodate gum teeth as well as plain without adding any extra risk of breaking. In the ordinary methods the full lower cases have been too heavy and the gums cracked, either during construction or in after years by the softness of the metal allowing them to move slightly; this we overcome by using rubber attachment. Then in the case of lower partials, the patient was sure to bend and break the plate unless it was made thick and bungling, this we overcome by a wire spring of Dr. W. H. Dorrance's invention.

Explanation.—Proceed as usual with impression, model may be poured of plaster, but plaster with asbestos or whiting is safe. To this method fit accurately a piece of piano-wire, No. 14, 16 standard gauge along the arch

so as to leave the arch about opposite the first molar; after fitting the wire to the arch bend each end inward at right angles with body of wire, then about $\frac{1}{4}$ inch from first bend make a second by bending wires upward forming an obtuse angle. This is done so that the wire will be held firmly in the plaster of the upper half of the flask; this done take a file and make a notch on each side of wire in the first bend of each end, this is done so that the wire will break in the proper place and easily when wanted; sandpaper the wire to remove all dirt from surface and dip first into muriate of zinc, then into melted tin, this is done so that the metals used for plate will flow along and become attached to the wire; the wire prepared, cover the model to just the extent that you wish the plate to cover the ridge when done. It is now necessary to decide whether to use a solid plate of metal or a rubber attachment. In nearly all cases if full lower, and if partials with much absorption, I use the latter, and have selected such a partial for description.

Warm the tinned wire and press into place, and cover the scar with a fresh piece of wax, which is now ready to flask. For this I find the Watt's flask most convenient, although the Weston is good and the one used in this case. In flasking, care must be used to have sufficient plaster under the ends of the wire to hold them firm and without breaking in the upper part of flask. With sharp knife make a groove around the edge of plate in upper part of flask just where edge of rubber will finish to, and is done so as to furnish a more secure attachment for rubber and a larger surface of metal next to the mouth.

For a more secure attachment, especially in full cases, I make several pits about $\frac{1}{2}$ inch deep in upper part of flask over the ridge, these can be made with an old excavator sharpened like a screw-driver. Now cut a gate from each angle, this I make ample as it can do no harm and proves a great convenience.

The two halves of flask are now dried separately in a

temperature that will not calcine the plaster; the oven of ordinary heating stove (as Stewart, Mogie, etc.) is a convenient place. When a mirror held over the warm flask will not gather the slightest moisture they will do to pour and not until then.

When dry the surface of the model should be rubbed with a piece of base plate wax to smoothen the surface and also to act as a flux for metal. The mould should be warm and the metal but very little above melting point when pouring, and should be cooled slowly to obtain a smooth casting. After separating the wire should be broken off with the finger. It will break just below the surface if the notches have been made as described. The small hole at each place where wire is broken is to be filled with some metal as that of which the plate is made, with a soldering copper (not tinned). To do this moisten the surface of plate about the hole with H Cl, or chloride of zinc, and place a piece of the metal over it and melt into place with warm copper. Now with a file smooth off plate in a rough form and fit to mouth; after fitting take the antagonism using plate just made as base plate, then proceed as usual with rubber attachment. Should you wish to make a solid plate after fitting the wire, you would proceed as usual with cheoplastic plates, excepting that after the case is on the articulator, the wire is to be put in place before the teeth are ground.

Any of the alloys of tin in use may be used for construction of this plate. While I have tried them all I like 15 parts silver to 85 of tin, although the addition of 3 per cent. of bismuth makes a good plate.—*Ohio Journal of Dental Science.*

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ARTICLE III.

INJURIES TO THE GUM SEPTUM.

CONCLUSION OF AN ARTICLE BY DR. BLACK UPON "INTER-
PROXIMATE SPACES."

I will now refer more particularly to injuries of the gum septum during operations upon proximate surfaces. This tissue suffers as little, perhaps, from temporary abuse as any other, but it is liable to serious injury from long continued maltreatment. One of the most constant abuses occurs in cases in which the treatment of root canals, or exposed pulps, requires some kind of temporary fillings. In these, it seems to be common practice to fill both the cavity in the tooth and the interproximate space with cotton saturated with some kind of gum or with gutta-percha forced into position without reference to compression of the gum tissue. Indeed severe compression is often recommended as a means of getting the gum tissue out of the way while making the filling. In this way the gum septum is often destroyed, or a deep pocket formed centrally between the teeth. After the treatment is finished and the cavity filled, even when the proximate space and contact are left in good form, this gum septum often fails to recover; or is only partially restored to its former fullness and strength. If the proximate contact is faulty it is irretrievably lost, for the vacant interproximate space or the pocket which has been formed centrally between the teeth, fills with debris which undergoes decomposition with the formation of acid in contact with the unprotected margins of the newly placed filling. This insures a recurrence of decay even though a perfect filling has been made.

The destruction of the gum septum may have been regarded as legitimate in times past, especially after we had

cohesive gold and before we had rubber dam. The mode of practice has, in a manner, been inherited by us of the present day. But close observation of cases has shown its evil results, while improved methods demonstrated that this mutilation is unnecessary. It is easy to take a thin blade, such as one of Harlan's scalers, or a somewhat broader blade of the same pattern, and place one edge of it against the neck of the tooth operated upon and lean the other against the proximating tooth, and while holding this rigidly in place insert a gutta-percha filling firmly and at the same time protect the gum septum and give it sufficient space. This requires almost no time. It is convenient to have two or three widths of these blades for the purpose. Cotton and sandarac is an abomination and should have no place in a well regulated office.

In wedging teeth, injury to the gum septum is far too common. In times past many of us have driven wooden wedges between the teeth, crushing out the entire gum septum at a blow. I hope that mode of separating teeth is not practiced by any of us now, for it was essentially bad. I only allude to it to show how our profession has grown up in disregard of the contents of the interproximate space.

Although we may no longer drive such wedges, we are often guilty of destroying this tissue in wedging with rubber, cotton, etc., by injudiciously placing the wedge so that the gum is compressed, or by allowing it to slip from the proximate contact, where it should always be held, into the wider part of the space against the septum of the alveolar process, where, besides causing the patient extreme pain, it will do a lasting injury to the gum tissue. Possibly but few of us are entirely free from this, as an accident of practice, but to do this frequently, or to fail to observe great care to avoid it, and to use all means to mitigate the injury in cases of accident.

Injury to the gum septum in finishing proximate fillings often becomes a serious matter. Think of pushing

and pulling a separate file back and forth to file down a proximate filling with the saw on its edge, tearing the soft tissue at every stroke, often until the last of the gum septum is lacerated beyond recovery, if not entirely removed from the space. Then the fillings are finished with flat proximating surface that will catch and hold food between them and prevent the recovery of any gum tissue that may be left in the space.

The separating file should not be used to trim proximate fillings. When it becomes necessary to cut to make room between a newly made proximate filling and the neighboring tooth for passing finishing instruments a thin separating file might be used, but a fine saw held in rigid frame is better. This should be used carefully to make the one cut and then immediately laid aside. Every instrument used afterward should present a smooth polished edge to the gum tissue. The instrument with which I do the bulk of the trimming is the thread saw. This is turned with its smooth polished back to the gum tissue and cuts toward the occluding surface of the tooth. It is insinuated under the overhanging portions of the filling, and the trimming is expeditiously done with the minimum of injury to the gum. The trimming about the buccal, labial, or lingual angles, that this instrument will not reach, is done by the smooth edged draw files and with disks, and the contact point is rounded to the desired form. This work cannot be done with the same expedition and effectiveness with the separating file. Its shape is unsuited to the work.

Many dentists are using the revolving disk for finishing proximate surfaces. So far as the form of the proximate contact is concerned this is as bad as the separating file. The tendency of the disk is to cut away the prominence of the contact point, and this occurs almost inevitably when the endeavor is made to finish the proximate surface with it. Yet the disk is a very useful instrument for rounding the buccal or lingual angles of

proximate fillings. I make much use of it for this purpose, but do not use it between the teeth, except occasionally a rim disk when I have plenty of room to pass the rim safely beyond the contact point.

Now it may be said that the dental profession have used flat separating files for forming the proximate surfaces of fillings from time immemorial, and certainly their fillings have not all failed. Certainly not. Many good fillings have been made in spite of the unsuitableness of the flat files, and there has been a continuous advance in the treatment of proximate surfaces up to the present time. So please do not consider me pessimistic in this matter. But many teeth of bad form and faulty texture have never decayed. Many contact points, flattened by wear, have never leaked food into the proximate space. Also, many fillings of bad form have done excellent service. Yet it is the teeth of bad form and faulty texture that decay most. It is the badly worn contacts that oftenest do damage by leakage. It is the fillings of bad form that are most liable to failure.— *Dental Review*.

ARTICLE IV.

COPPER AMALGAM, SOME OF ITS MECHANICAL USES.

BY JOHN G. HARPER, D.D.S., ST. LOUIS, MO.

Read before the Missouri State Dental Association, July, 1892.

The mechanical uses of copper amalgam are quite numerous, for instance cold soldering, dies, etc. First we will consider the making of the amalgam by a simple process. One is as follows:

"Dissolve 10 ounces of sulphate of copper in 2 pints of water, and then precipitate the copper by the intro-

duction of strips of zinc. Wash the precipitate in hot water two or three times, drain off, and for every ounce of precipitated copper add 2 ounces of mercury, add also a little sulphuric acid (say 15 to 20 drops) to aid in the amalgamation of the metals. The finely divided copper and mercury form a paste which sets and becomes intensely hard in the course of a few hours. It should be made up while soft, into little pellets and put away."

Here is another process; you can take your choice :

"To 1 oz. (troy) of pulverized sulphate of copper add 8 fluid ozs. of warm water. This dissolves the salt promptly. A piece of thick bar iron previously brightened by being placed in a pickle bath, should now be immersed in the solution. The formation of solution of sulphate of iron and the precipitation of copper in fine pulp commences immediately. This process continues for several hours, and the copper pulp should occasionally be scraped off the iron plate into the solution with a piece of stick; when no more copper precipitates, the iron plate should be taken out and cleaned for future use.

"The supernatant solution is of a yellowish green color, and when it is reasonably clear by the setting of the precipitate, it should be carefully poured off; sufficient pickle is now poured upon the precipitate, and this is frequently stirred with a glass rod. This is for the purpose of cleaning and purifying the copper pulp, and should be done at intervals for several hours, until no bubbles rise from the agitation. When sufficiently pickled, the acid water is poured off, and the soft pulpy residum is put into a glass or wedgewood mortar, to which is added 1 oz. of mercury, the whole is then rubbed up with a pestle, and prompt and complete amalgamation ensues. After the amalgam is made, it is washed repeatedly. The mass is now squeezed gently through a chamois skin, and the half-squeezed mass is thoroughly triturated in the mortar; it is then squeezed hard, and again triturated, divided into small portions, and is either packed into molds or

squeezed into wafers, and allowed to harden. This takes from 12 to 24 hours, and the amalgam is then ready for use, and in the form in which we obtain it from the depots."

The first process is from the *National Druggist*, and the second one from the *Western Dental Journal*. We are also indebted to the *National Druggist* for the following methods of cold soldering:

"The flux consists of 1 part of sodium to 50 parts of mercury. This must be carefully protected from the atmosphere in a glass-stoppered bottle. This has the property of amalgamating any metal with which it comes in contact, forming an adhesive amalgam even on cast iron. First amalgamate the surface to be joined by rubbing them lightly with the flux. This is the equivalent of tinning in the ordinary soldering methods. Then take one (or more, as the case may be) of the pellets of copper-amalgam and warm till the mercury begins to exude at the surface, wipe off the exuded drops with a clean rag, and drop the pellets in a small mortar and rub till smooth, or about the consistency of prepared white lead; smear this over one of the surfaces to be joined, and apply the other surface to the latter as quickly as possible. The joint sets so firmly in the course of two and a half or three hours, that only a hammer and cold-chisel (or a degree of heat sufficient to melt ordinary solder) can separate the surfaces."

I called on the editor of the *National Druggist*, to get some further information on the above subject. He told me he had cold-soldered a band-saw, and to his certain knowledge it had lasted for over a year.

Mr. Windhorst, a dental student, used the cold soldering process to replace a tooth on a bridge with satisfaction, also soldered the shank of a mouth mirror, which had been broken, and could not be hot-soldered without taking the glass out.

"For an even stronger and much quicker setting

solder, where expense is no item, take the following to replace the copper and mercury (using the same flux):

Silver	-	-	-	8 parts.
Tin	-	-	-	10 parts.
Bismuth	-	-	-	1 part.
Platinum	-	-	-	1 part.

"Melt together and cast an ingot. Rasp to filings, or otherwise reduce to small particles. When required for use, mix about 3 parts of filings and 1 of mercury in a small mortar till it becomes smooth paste. This sets in about fifteen minutes, and cannot be made workable again by heat; it must be mixed as required.

"The omission of the platinum reduces the strength of the solder, and lengthens the time required to harden to about one hour. The omission of bismuth makes a more granular mass, which is better for filling up crevices, with bismuth it is as smooth and plastic as potter's clay. Joints made by this solder are almost inseparable. It is very valuable in repairing surgical and philosophical instruments, the brazing of delicate springs, and in all cases where the application of heat would be hurtful or destructive."

Cold welding has not been a success in my hands. I purchased the sodium amalgam already prepared, shall make some myself according to the formula given, and try that.

The first person to recommend copper-amalgam for dies for crowns, was Dr. J. W. Whipple. He made a depression in a block of lead, filled the depression with softened copper-amalgam, imbedded the formed crown in the soft amalgam, this when hard gave a female die of the cusps.

Dr. Gilmore for some time has been using copper-amalgam dies for forming gold inlays. The cavity of the tooth is properly formed, all undercuts filled, also a portion of the cavity with cement, this when hard is trimmed smooth, the remainder filled with gutta-percha, and a cross

cut is made in the surface to act as a guide. An impression is taken of the tooth, the gutta-percha filling removed and properly placed in the impression, being held in place with a little varnish. The impression is filled with copper-amalgam, the rest of the impression is filled with plaster of Paris, and articulation made if it is desired. When the copper-amalgam has hardened, the impression is removed leaving a model of the tooth with the cavity.

Number 120 gold is pressed into the cavity, removed, imbedded in a mixture of plaster of Paris and pumice stone. This gold matrix is filled with small pieces of 20k plate, melted carefully with the blow-pipe, when it is ready for polishing and cementing into the cavity,

Models of teeth for forming clasps made of copper-amalgam are superior to plaster ones.

Models of roots for crowning are more satisfactory if made of copper-amalgam.

Amalgam models of teeth for forming caps for the retention of the teeth, or regulating appliances, can be used with a high grade of gold.

These suggestions are given in the hope that they will be a benefit to the profession, and bring these ideas to a number who have heretofore overlooked them when presented in a different form.

The *Dominion Dental Journal*, July, 1892, contains the following hints regarding the mechanical uses of copper-amalgam. They are appended to the original paper in order to make it nearer complete. "Copper-amalgam is very useful for many things in dentistry, besides filling teeth. It may be used for fastening a tooth on a rubber plate, making a full crown for back molars, making matrices for striking up a gold cusp or articulating surface for a gold crown, strengthening or reinforcing plaster models, cusps or any part of the gums or root of a tooth, or a whole tooth may readily be built up in the impression before running the plaster into it. This is often very useful when it is necessary to fit a gold or platinum band

round a tooth or root, as the amalgam tooth is quite hard enough to burnish on, while the plaster tooth is frail and would be broken. The amalgam can be saved and used over and over again."—*Western Dental Journal*.

ARTICLE V.

WHY DIFFERENT RESULTS FOLLOW THE SAME LINE OF TREATMENT IN SIMILAR PATHOLOGICAL CONDITIONS IN THE ORAL CAVITY.

BY J. D. PATTERSON, D. D. S., KANSAS CITY, MO.

Read at the annual meeting of the Missouri State Dental Association, at Clinton, Mo., July, 1892.

You must agree with me when I say that in our reading of dental literature and especially in discussion before society meetings we are confronted with the fact that the similar treatment of similar pathological conditions are said to bring about such complex, diverse and heterogeneous results. We are often constrained to wonder which of the two, the operator or the patient, presents such curious idiosyncrasies. As knowledge increases and as every year should bring to the dental practitioner a more perfect science in combatting disease, it is therefore of prime interest and importance why these apparently unexplainable results should follow.

In looking carefully over the field it must be admitted that a not inconsiderable factor in bringing about these curious results must be found in the fallibility of human testimony. It *may* be on account of the fact that the operator may not have been accustomed to carefully weigh his words, or be possessed with the idea that he must antagonize his *confrere* and assent dogmatically what he only surmises.

In a given pathological condition one operator details a certain treatment with a certain result. His neighbor may in a similar case with similar treatment have a different result. Now in endeavoring to harmonize these opposite statements we almost invariably look for different physical conditions, and, if we do not find them, we are apt to think the matter is not explainable. If, however, we were to study the two operators who have made these two opposing statements possibly the difficulty would be easily solved. The method of one of them although stated to be the same as the other, is found really to have no parallel at all. The education of one of them has been defective—his manipulative ability and scientific knowledge has no parallel in the other and more highly trained hand and mind—and therefore his evidence cannot be said to be reliable. He will tell you that he did thus and so,—and the result was not the natural sequence to be expected—when the fact has been that he did not do so at all. He did not mean to speak falsely, but at the same time he *did* speak falsely. He said that he had perfectly removed all cause of irritation, and in medication used the remedies scientifically. His better educated confrere would find neither of his statements true, but at the same time must criticise his education and not his honesty. So I apprehend, as at first I intimated, that a not inconsiderable reason for the diverse results from the same treatment is found in this fallibility of testimony which is the result of a difference in the acquirements of the operator. This feature of the question, however, can perhaps only be considered as subjective. The chief study of the question suggested by the title of this article may be found in the study of the tissues upon which the operator labors, rather than in the study of the operator himself.

In the surgery of the mouth we find that in inflammatory conditions certain prescribed and standard treatment seems at times to have little or no effect, while again, the relief is instantaneous, and careful study results in the

knowledge that tissue conditions potently control, limit and assist the curative efforts of the operator.

It is found that every human body presents differences which must affect our efforts in combating disease. The condition in the life of the tissue as viewed from a standpoint of perfection where every departure from normal would, under treatment, have only one result, presents to the student such varied manifestations that a continual research is necessary in order that the operator shall suit his treatment to the character of tissue upon which he works. Every man, woman, or child presents to an outward view certain peculiarities of appearance—certain distinctive movements in mind and body, that we can well believe that similar differences must be found in the tissues which compose their bodies. We find in constitutional temperaments and their sub-divisions a marked difference in tissue character, and is it then still wonderful that similar treatments in similar troubles give diverse results? If you will insist upon treating a highly nervous, encephalic patient in the same manner and with the same strength of dose as you would a rugged, bilious or lymphatic one you must expect dissimilar and unsatisfactory results. Every human tissue, hard or soft, adipose or cellular, has come into existence perhaps under different conditions in its formative stage, and some difference in the cell perfection is found. It may have been surrounded by predisposing influence, such as weak nutrition, low vitality, and the result is that the cell elements are lacking in perfect material and ever afterward are unable with great vital force to throw off disease attacks.

This condition in our patients can be diagnosed by appearances, general and minute, showing in general the lack of tonicity and vigor, and in the tissue an inability to throw off local irritant attacks, by judging of the constitutional temperament and following out in treatment that knowledge which the study brings.

Again, in all pathological conditions the susceptibility

of tissue to cure is widely influenced by *acquired*, hereditary or constitutional conditions—cachexia—in which a depraved bodily habit exists *e.g.* the scrofulous, cancerous, the syphilitic. This condition demands close observation, scrutiny and skill, if we would serve our patients well who are suffering from specific blood taint. We will not enter into the discussion as to whether the scrofulous, the leprous and the cancerous all belong to the syphilitic, but only to the consideration of the class which so far as our specialty is concerned may be considered as one class.

Those who have been careful observers must have noticed how difficult and disheartening is the attempt to allay pericemental irritation or cure inflammation of the mucous membrane, when there is the syphilitic or scorbutic condition. The abscess which we are treating goes very slowly to a cure, and drainage must be left open longer in these cases. There must be extreme care in each detail of the operation so that irritation is reduced to the minimum. Where tissue is healthy a considerable amount of morbid matter may not cause irritation, but where a cachexia exists the least amount will cause inflammation. In these cases also, after all has been done that skill and patience can devise and the permanent root filling inserted, it will often be found that continued or periodical chronic soreness will remain for months or years. In the cavity of the antrum where dental irritation has had its seat and the patient is syphilitic I have had two cases where I have finally despaired of a permanent cure, the trouble recurring when the bodily condition fell into one of the characteristic low periods which is so familiar to students of that disease.

The result we account for by finding that in these tissue conditions the ability to ward off disease is a weak tone; the vital safeguards are wanting, and when the tissue is invaded the lymphatics and absorbents are so crippled by their imperfect structure that effete and ir-

ritant matter is very slowly carried away or absorbed. The practitioner then should be perfectly conversant with the physical signs which denote a cachexia, so that added care and skill shall be given such cases. In medication in these cases the general rule must be that more time and a greater amount of germicides, disinfectants and stimulants must be used, and this always in conjunction with remedies internally administered and strict hygienic supervision. In all the departments of dental practice I think that in these cases perhaps greater acumen is necessary than in any other work which we are called upon to do.

Another important reason why anticipated results do not appear in treatment is the degree in which the tissue may be *locally* perverted. In neglected abscess for example, (and I make no apology for again instancing abscess; for it is the most usual pathological condition we are brought in contact with) when it has run its course and has been long neglected we find the neighborhood surrounding the apical portion of the tooth impregnated with morbid matter and inflammatory effusions. The healthy tissue is gone and in its place we find the perfection and continuity of tissue broken and infiltrated with depraved cell elements, which poison and irritate. There are irregular patches of repair tissue where a struggle has been made by nature for a cure, but without avail until surgical science has assisted. The history of these cases is generally misleading and we often fail in their treatment because we do not diagnose a long standing diseased condition. The immediate root filler who treats each case of pulpless teeth in one way will especially be brought to see how *painfully* different are the results which follow his treatment.

When this class of cases is found in cachetic patients the complication is still harder to treat and the utmost skill, knowledge and patience is necessary. After a cure is effected and new tissue in patches takes the place of the original, it is a tissue which is always under suspicion and

gives way quickly under renewed irritation. In all repair tissue the cell elements are perverted, the vascular and nervous supply is irregular, constricted, and its power to throw off irritation is small. This tissue will, under debilitating influences of health and climate, give evidence of its condition in low grade pain without local irritation. A familiar example is seen in a tooth which has been restored after long disease and loss of tissue and around which there is much repair tissue and process. These are cases which require the most scrupulous care and judgment.

Another class of cases still which give almost surely a negative result, are those where disease has long surrounded the apex of the root until perverted cells have attacked the surface of the root, eating deep irregular burrows, leaving sharp spicula-like edges, spiking the new tissue forming until inflammation results. The extreme difficulty with these cases is that we have no means by which we can judge whether such a condition is present or not and therefore we grope blindly until extraction shows the trouble. The surgical operation of amputating and smoothing the ragged end is the only operation that is available.

In summing up upon the subject we see therefore that in pathological conditions of the oral cavity, we must consider a great variety of factors to determine why certain results come, or do not come under treatment.

- 1st. The intelligence of the operator.
- 2d. Hereditary constitutional conditions.
- 3d. Acquired conditions of tissue.
- 4th. Cachexia.
- 5th. Local tissue conditions acquired by local disease.

The study of the subject is one of practical interest, and when fully comprehended will enable us to reach success when hitherto we have oftentimes been confronted with failure.—*Western Dental Journal*.

ARTICLE VI.

THE DEVITALIZATION OF THE DENTAL PULP.

BY W. D. MILLER, M. D., PH. D., BERLIN, GERMANY.

The devitalization of the dental pulp has repeatedly been made the subject of communications to the dental journals, and of discussions in dental societies. Expression has often been given to the general complaint that application of arsenic to the dental pulp is too frequently followed by severe pain, and various means have been suggested for rendering that operation less trying to the patient.

My experience in the devitalization of pulps differs somewhat from that of many writers on the subject, in that I am able to perform the operation without pain; at least I have not had a single case in the last two years in which the patient has complained of severe pain after the application of arsenic, and in nearly all cases they have said they had felt nothing whatever. A description of the manner in which I devitalize pulps may, therefore, be of service to some of the readers of the *Dental Practitioner and Advertiser*. Not that I employ different materials from any one else, or use different methods, but I certainly do accomplish the result without pain.

With occasional exceptions, I adjust the rubber dam where arsenic is to be applied, then bathe the cavity thoroughly with carbolic acid, and remove the decayed dentine as thoroughly as possible without producing unnecessary pain. I find it desirable, as others do, to have a large surface of exposure to which to apply the arsenic, but I apply it to a small exposure rather than give the patient pain in the attempt to enlarge it. I now place two or three drops of carbolic acid upon a glass slab, and add as much of the hydrochlorate of cocaine as it will dis-

solve. A pledget of cotton, supersaturated with this solution, is placed in the cavity and left there while I am preparing the paste. I have in a small bottle a preparation consisting of equal parts of acidum arsenicosum and morphinum muriaticum, with just enough carbolic acid to hold them together (not to make a paste). I take a bit of this, a little larger than a pinhead, and make a paste of it with the saturated solution of cocaine in carbolic acid. I now remove the pledget of cotton from the cavity, take the paste upon the point of a suitably shaped excavator, and apply it directly to the point of exposure. Over this I place a small, flat pledget of cotton, well saturated with the cocaine-carbolic acid solution, being careful not to let the cotton extend over the margin anywhere, and avoiding every trace of pressure.

As far as the action of the cocaine is concerned, I have no doubt the same result may be obtained by incorporating the crystals with the ordinary thin arsenic paste usually employed. So far as I know, the following formula, which has been repeatedly recommended, would serve the same purpose:

R— Acidi Arsenicosi,
 Cocaine Hydrochlorate, aa, 0.5
 Acidi Carbolici, q. s.
 Ut fiat pasta mollis.

Personally, I have always used the fresh crystals of cocaine.

Now comes a very important part of the operation, that of retaining the application in position. If I had my enemy in the chair, and wished to make him atone in one night for all the sins he had ever committed, I would take some cotton, roll it up into a hard ball, saturate it with sandarac varnish, and force it into the cavity. The use of cotton and sandarac for retaining applications to the pulp appears to me to be utterly inexcusable. I think that one would be justified in calling it not only irrational, but slovenly practice. More or less pressure is absolutely

necessary to make the cotton stay in place, and this is sure to increase the probability of pain in a high degree, to say nothing of the danger of causing minute quantities of the arsenic to exude and come into contact with the gums, while the cotton itself, unless packed very tight, soon becomes permeated with the secretions of the mouth.

The method of covering applications to the pulp with gutta-percha has also always appeared to me very objectionable, simply because it is next to impossible to cover the bottom of a cavity with a pledget of cotton, supersaturated as it should be with some local anæsthetic, and then fill over this cotton, wet with gutta-percha solution, so as to obtain anything like a watertight filling, without exerting pressure upon the cotton. For all cases where we have to enclose applications on cotton, the oxysulphate of zinc is vastly superior to gutta-percha. I use the preparation known as Fletcher's artificial dentine, but am not acquainted with preparations of a similar character which may be on the American market. I mix the preparation moderately thin, so that when it is taken upon the spatula it hangs down slightly. It should not, however, be thin enough to drop off. For inserting it, I use in most cases a very thin, sickle-shaped spatula. Taking a small quantity upon the end of the spatula, I draw it across the margin of the cavity, just about as one draws a plaster knife across the edge of a board to wipe the plaster off. I thereby fix the cotton on one margin; then in the same manner it is covered on the opposite margin, eventually a third or fourth portion being necessary to complete the operation. For approximal cavities in molars, an instrument bent upon its surface will sometimes be found preferable to a sickle-shaped one. The method of applying the cement is also somewhat different for molars, but a little experience will soon make the manner of manipulation apparent to every one. Like everything else it requires some practice.

With the oxy-phosphate, or even with plaster of Paris

one can place a wet pledget of cotton in the open end of a tube $\frac{1}{4}$ inch in diameter, and fill over it without displacing the cotton, or exerting the least perceptible pressure upon it, a thing which cannot be done with gutta-percha, or any other material that I know of. My manner of applying arsenic was put to a severe test a few days ago in two quite similar cases, one of which I may relate. A middle-aged gentleman, of nervous temperament, presented himself, with an aching tooth on the right side of the upper jaw. An examination revealed a second molar decayed on the distal surface. The cavity contained a pledget of cotton, the removal of which was followed by a paroxysm of severe pain, and a drop of pus was seen to exude from the point of exposure of the pulp. I make it a rule never to apply arsenic to an aching or highly inflamed pulp, but in this case, for special reasons, I decided to deviate from the rule. I at once inserted a pledget of cotton, saturated with the cocaine-carbolic acid solution, which was allowed to remain about five minutes, the pain gradually diminishing in intensity; I then asked the patient to rinse his mouth (not a necessary part of the procedure, however,) and renewed the application, which I left in the cavity while I was preparing the arsenic paste. The latter was applied as described above. When I had finished, there was still some grumbling pain, which disappeared gradually and entirely inside of ten minutes, and the patient did not have a trace of pain afterwards. The pulp could be extirpated on the following day. Thus the application of arsenic was made the means of completely stilling the pain, instead of producing the violent suffering so often complained of. In another case, two days ago, a young lady came to me with an aching tooth which had troubled her more or less every day for weeks. It was so sensitive that the touch of the finger, unless quite warm, produced severe pain. I applied arsenic with my usual care, and from the moment she left my office she felt nothing whatever to remind her that she had a decayed tooth.

I attribute my success in this operation to the observance of the greatest possible delicacy in making the application to the pulp, in particular to the avoidance of every trace of pressure, and secondly to the maintenance of a constant anæsthetic condition by use of the cocaine-carbolic acid solution.—*Dental Pract. and Advertiser.*

ARTICLE VII.

PYORRHŒA ALVEOLARIS.

BY H. J. BURKHARDT, D. D. S., BATAVIA, N. Y.

Read at the Twenty-fourth Annual Meeting of the Eighth District Dental Society, held in Buffalo, April 19 and 20, 1892.

In presenting a paper on this subject, I feel as though an apology was due, because I am unable to offer you anything especially new. My purpose is briefly to narrate experiences with this disease while, with my brother, in charge of the practice of the Dansville Sanatorium, and to give you the observations I have made since. I have some statistics which I intended presenting, but am unable to do so from lack of time in which properly to tabulate them. As you are well aware, people who spend any considerable amount of time at institutions of the kind mentioned must, of necessity, at least start in with a full purse, and as a rule they are above the average in intelligence, investigations as to hereditary influence in the various diseases are more easy and reliable than in most cases.

I will not burthen you by a recital of the many and various theories of eminent practitioners as to the etiology of pyorrhœa alveolaris. Our literature is quite full, and yet no general theory has been accepted. Local, constitutional and bacterial theories, have been almost exclusively discussed of late. The latter has not received

the attention the question merits. The advocates of local and constitutional causes are nearly equally divided.

That pyorrhœa alveolaris is a local expression of a constitutional disease, in a large majority of cases, I can prove most conclusively by my investigations. I have seen and had charge of one family of three generations, each being unmistakable cases of pyorrhœa, and within a year three families, two generations of which were in the same condition. Notwithstanding all this, I have yet some faith in local conditions as a cause in some instances. Nearly all of those who came under my notice were suffering from rheumatism, gout, local or general catarrh, dyspepsia, liver or kidney disease, or intemperance. By far the large majority were those of dyspepsia, and they of all others were most difficult to treat. Rheumatism and the various kidney diseases belong to the same category. Those of lymphatic temperament and scrofulous diathesis were practically incurable. A most marked peculiarity of the dyspeptic was the age, number of teeth affected, and scant discharge from the gums in extreme cases.

Middle life is the time pyorrhœa usually selects for an attack, and in a large percentage of cases in which dyspepsia was the exciting cause, the average age was about thirty. Right and left superior sixth and twelfth year molars and inferior central incisors were almost invariably the afflicted members, and why these particular teeth were the ones selected I should be pleased to have some one explain. There were many peculiar features observed, characteristic of the usual systemic disorder, an enumeration of which, at this time, would consume too much of your patience.

You are all familiar with the diagnosis of these cases. Where there is little tartar present and little inflammation, the prognosis is unfavorable; but where there is an abundance of tartar, a fairly safe prognosis can be made. Of course the general health plays a very important part in

the conclusions arrived at. In the treatment, authorities do not widely differ. My plan is first thoroughly to remove all tartar, carious and necrosed bone, which can not always be done at the first sitting on account of profuse hemorrhage where many teeth are involved, and when there is general hypertrophy of the gum tissue. Amputation of the root of a tooth having more than one root I consider good practice, as the remaining roots are usually abundantly able properly to support the tooth. Just here let me contradict the assertion so often made in conventions, that a pulpless tooth is not liable to be affected by pyorrhœa. About the worst cases I ever saw were those of pulpless teeth, and as a general thing they could not be saved. I did not take the patient's word in regard to the canal having been filled. In several cases I had performed the operation myself, which seemingly was a success. The pus pockets should be evacuated by the injection of peroxide of hydrogen, and where there is any considerable amount of congestion, free lancing should be resorted to.

Where the teeth of one or both jaws are affected, I am a firm believer in the heroic treatment, as advocated by Dr. Riggs. The next consideration should be fastening of the loose teeth, and right here there is a great diversity of opinion as to the right kind of an appliance. Swaged cusps of copper, connection by means of gold fillings, ligating with floss silk or gilling twine, and metal bands, have all been used. The swaged caps have been discarded by me on account of the time required to construct, the difficulty of obtaining a correct articulation, and the offensive taste. Connecting by means of gold fillings I consider impracticable, except in a few isolated cases. The dirty, pestilence-breeding floss and gilling twine I have no use for. My preference is for a band of either gold or platinum, 35 gauge and a quarter of an inch wide, made large enough to encircle all the teeth affected, and where there are only a few afflicted, one or two healthy teeth on

each side. Wherever it is possible the rubber dam is applied, and if that can not be conveniently done, napkins are resorted to and the teeth thoroughly dried. Oxy-phosphate of zinc is then thinly mixed and spread or smeared over the labial and palatine surfaces, and the band slipped up about midway between the gum margin and occluding surface. Next, fine binding wire of silver or platinum is slipped through the gum margin, from the labial to the palatine surface, brought between the teeth near the incisive edge, and back to the gum, twisted, and the slack taken up. This is repeated in each space, and when the last one is reached you have all of the teeth firmly bandaged. Care should be taken to allow the patient to close the mouth frequently during the process of wiring, so that loose teeth are not drawn out of position. With the aid of the burnisher, a few blasts of hot air and the removal of surplus cement, the case is completed. This gives you a firm, strong, clean bandage, quickly constructed and applied, and comfortable for the wearer. Local treatment should be given every day for a few weeks. As a solvent, pure sulphuric acid has been very successful in my hands. For the gums I use tincture of iodine, salicylic and tannic acids, and a wash composed largely of hydronaphthol, have proved very efficient. Where the secretions of the mouth are offensive, five or six grains of chloride of zinc to an ounce of water, used as a gargle, is very beneficial. Remedies must be frequently changed to meet the varying conditions.

When it comes to constitutional treatment, I always try to work in harmony with the family physician. Cathartics, tonics and alteratives are decidedly useful. If the disease is due to an enfeebled condition of the body, digestive stimulants and plenty of exercise in the open air are indicated. If it is due to any particular cause, such as rheumatism, dyspepsia, etc., strict attention should be given to proper constitutional treatment to correct the exciting cause. Sponge grafting I have tried, but not with

any appreciable good result. Thorough cleanliness should be insisted upon, and the mouth kept in as nearly an aseptic condition as possible.

Just a word in conclusion as to the application of crown and bridge work in mouths of pyorrhœal patients. I am a thorough believer and an advocate of crowns and bridges in the right place, but this is not in mouths where there is any considerable recession of the gums or indications of pyorrhœa. I can speak feelingly on this phase of the question, because of numerous funerals of my own and others. Within two years I have removed several bridges and crowns where the work had been well done. Last fall a gentleman came to me with a bridge in the lower jaw, attached to a canine, second bicuspid, and twelfth year molar, so loose that I removed the whole business with my fingers without the least trouble. The work had been beautifully done by a competent dentist, but the mistake was in the selection of the mouth. This is only one of numerous cases. I thoroughly believe that no tooth in a mouth where pyorrhœa is present should be made to assist in supporting an appliance of any kind, or to do more than the work intended for it. I have several bridges in mouths with a predisposition to pyorrhœa which apparently are all right, but I have little faith in their permanence.—*Dental Pract. and Advertiser.*

ARTICLE VIII.

SURGERY OF THE ANTRUM.

The antrum is only one of the air cells of the skull, and since it is of importance as the largest of these, it is known by the dignified title of the "Antrum of Highmore." It, like other air cells of the skull, is lined by the Schneiderian membrane. It is of significance to the oral sur-

geon because it comes within his jurisdiction to treat its diseases, and it is the only air cavity that bears any relationship with the teeth. The antrum is located mainly within the superior maxillary bone, but its walls are completed only by the addition of the inferior turbinated, lachrymal and palate bones, which bones are interested in forming most of its nasal wall. It is triangular in shape, with its apex pointing to the canine fossa. The base looks backward toward the palate. The other walls look respectively toward the nasal fossa, the orbit and the palatine process of the superior maxillary bone. If this cavity has any function I think it differs somewhat from the function of the remaining air cells of the head, viz., to warm the air before it passes to the lungs. To retain the contour of the face nature has combined in this bone, by the formation of this air cavity, both lightness of weight and extent of surface. She has furnished an ample frame for the face and yet retained the remainder of weight in the poise of the head. If the cavity were solid bone tissue, it would make a remarkable difference in the weight of the head. There is another feature of importance which is the better maintenance of blood supply to the face, and of direct importance to the dental surgeon, in that by the presence of this cavity a freer supply of blood and nerve force to the molars and pre-molars is maintained. All diseases of this cavity would be treated surgically. Yet we would not wish to magnify the importance of the diseases connected with it. It is subject to about the same diseases that may affect any other mucous membrane; add to this the fact of its being a cavity of some obscurity, and rather restricted walls, and we have in view all the obstacles with which we have to contend in diagnosis and treatment. Any antral disease attains importance, not as regards the antrum itself, but as the progress of the disease affects the surrounding tissues. In most cases while the disease is confined to its own walls there is little or no inconvenience to the patient; but should it press upward, the orbital

cavity is invaded. If the disease should extend at the expense of the inner wall of the cavity, the nasal fossa would be invaded, and should the floor of the cavity give way, the mouth would be associated with the disease. A forward projection of the disease would involve the face. From this we find that the oral orbital and the nasal cavities are not only liable to be connected in disease with the antrum, but owing to the thinness of the partition walls they are easily invaded.

For purpose of diagnosis and treatment of any disease of the antrum, access to the cavity must be gained. There are three ways of entering the antrum. There are two ways practical to the oral surgeon, and both of these are by way of the mouth. These are by way of the canine fossa, which is a little depression just posterior to the root of the upper cuspid, and by way of the alveolar cavities of the bicuspids and molars. The third entrance is by way of the middle meatus of the nasal fossa. This, in reality, is the only entrance which in the recent state is open. The dental surgeon is not equipped with instruments for treatment through this opening, and had better restrict himself to the other means of egress. Entrance should be gained into the antrum by way of the canine fossa when the apex of the cavity can be definitely located. The disease may indicate the position of this opening, and under the circumstances you are justified in perforating with a steel instrument and enlarging the opening to a convenient size. This is especially indicated if the teeth are all present and found to be intact.

Engorgement of the antrum characterized by facial tumor is the indication for this plan of procedure. Where facial tumor is not present, there is no absolute rule by which you can reach the antrum through the canine fossa. The development of the antrum is so variable it cannot be perfectly determined just how far forward the cavity is developed. It may be as far forward as the cuspid or no farther than the first molar. There is little

risk in forcing entrance through the palatine root of the second molar, and this means should always be resorted to if possible. Facial tumor and preservation of the teeth would indicate the canine fossa operation. The alveolar operations are preferable where the preservation of the teeth are not concerned. It would be of no purpose to enumerate the various diseases which may afflict the antrum and indicate their treatment. These points of information may be gained by consulting any chapter on mucous membranes and their diseases. With the antrum the diseases are complicated by their being confined to a cavity, Free and open drainage for the cavity is the first principle of treatment; antisepsis the other.

The operator is frequently brought in contact with the antrum accidentally in the process of extracting teeth. This may occur by forcing the root into the antral cavity, thereby fracturing the alveolar wall, or by tearing away part of the floor of the antrum with the root of the tooth. Either may produce a complication in the form of troublesome inflammation. The former mishap would necessitate the enlarging of the opening made, and a removal, if possible, of the foreign body. If this could not be accomplished, the opening should be enlarged.

There are, no doubt, many obscure pains, especially of a neuralgic nature about the head and face, that arise from antral trouble, and a little surgical interference will often relieve complication.

There are diseases of the antrum, that are brought by association with the other air cavities, amenable to treatment through the nasal opening of the antrum, but these are not in the fold of the oral surgeon.—G. S. JUNKERMAN, of Cincinnati, in *Items of Interest*.

ARTICLE IX.

AMALGAM FILLING.

It is frequently admitted that amalgam has been a much-abused material. This charge against dentists is more true in relation to contour fillings than in any other connection. It will not suffice to say that, for contouring, amalgam, is a *valuable* agent. It is necessary to say that it is *invaluable*. Its usefulness is inestimable. It may be made to save teeth which, without it, would be lost, or, at least, even if saved, would be of but slight service for mastication.

In the realm of contour work, amalgam occupies a place that is unique. With it can be restored all those forlorn cases, those wrecks, which half a century ago were inevitably consigned to the forceps. Yet, with shame it must be admitted that only a very few men know how to obtain the most desirable results with amalgam in these very cases. The man who can restore a molar where caries has advanced beneath the gum, two or three cusps being entirely absent, and build on this unpromising foundation a tooth which becomes as useful as the original, and which, moreover, remains permanently in place without fretting the gum and without inviting decay along its borders, has more right to count himself skilled than the best gold-filler.

In small cavities the plastic is the more manageable material, but as the size of a cavity increases, manipulation with gold becomes *less* difficult, the added obstacles being only the tediousness of a lengthy sitting. With amalgam it is otherwise, for the larger the cavity the *more* difficult it becomes to attain the highest success.

Amalgam, then, in contour work may well attract our special attention. I must point out the obstacles to its proper use, and tell how to combat them. How often

have we all expended a half hour or more restoring a lost corner of a molar, only to have it return on the following day, with a portion missing? We say to the patient, "You must have bitten something on that before it was thoroughly hardened," but that is no satisfaction either to patient or dentist.

This tendency to fracture, in an amalgam filling, is due to several things. Of course, if the occlusion be sharp, the explanation given by the dentist may be true; mastication may have dislodged a portion of the mass. But where such an accident is possible, the dentist must note the fact and guard against it in advance. The filling must leave him so shaped that it will not be disturbed by the closing of the jaws, even so much as by the production of a slight scratch, by the perpendicular or lateral action of the jaw. The patient must be asked to gently move the jaw from side to side, as he would do in eating. This brings the cusps of the opposing teeth into all the different relations which they are to bear, and if the filling is unmarred by this, the single warning to chew on the opposite side during the succeeding day, if obeyed, will bring the filling in good condition, or we must protect the filling, temporarily building a tooth with gutta-percha.

But it is often by a cause other than mastication that the filling is broken. We take the utmost care to keep a gold filling free from moisture, yet some men do not hesitate to insert amalgam with the cavity and surrounding parts flooded with saliva. This so-called submarine work not only should not be practiced, and a clinician showing it before assembled students, or practitioners, should be roundly condemned. In contour work with amalgam it is of the utmost importance that the perfect crystallization of the mass should not be interfered with by moisture. The filling should be kept dry throughout the whole operation, if possible. Where the cavity extends far beneath the gum-margin, the tooth may be filled in two operations, though at the same sitting. Using the napkin as a dam,

amalgam must be packed till it extends beyond the margin, sufficiently far so that the rubber-dam may be placed. Then the cavity, and the amalgam already in place, may be dried and the filling continued. Thus it is shown that because a cavity cannot be kept dry with rubber-dam from the out-set, that is no reason why the filling should be allowed to become inundated several times, through a vain effort to control moisture with a napkin.

The next important point is to avoid fracturing the mass during the operation. This involves simply the proper application of force, and the proper consistency of the material. Amalgam, for use in a large contour, must be prepared slightly more plastic than for ordinary work. It is to be packed with balls of bibulous paper, with a wiping motion, thus forcing the material against the cavity-walls, as long as this action can be carried out. By this course the excess of mercury is forced out, and crystallization begins at once. Thenceforth the particles of that portion of the mass already in position *must not be disturbed*. If, by exerting force in a wrong direction, a part of the filling is fractured off, *it is folly to hope to get a good result by patting it back with a burnisher. The re-union will not be as strong as was the original union*. It would be better, where the accident does occur, to remove the separated piece, replacing it with freshly-mixed material.

Whether the remainder of the filling be packed with bibulous paper or with burnisher, it is from this point on that fracture is to be feared. The rule is very simple. *Pressure must be exerted only in line with the greatest resistance, offered by the tooth itself*.

The last essential is to dismiss the filling as far advanced toward crystallization as possible. This may be best accomplished by burnishing gold into it.—R. OTTOLENGUI, in *Cosmos*.

ARTICLE X.

THE PHYSIOGNOMICAL SIGNIFICANCE OF THE
FACE AND TEETH.

The physiognomical function of the face is to depict to the world the true character of the "inner man;" it is the mirror of the emotions—yes, of the heart itself. The faculty of reading the character by the outward natural signs, is instinctive in all men, though some have become so skilled by exercising and developing it that they claim to have occult powers, and with tact and a fertile imagination, do not fail to draw about them many faithful followers. Lavator says, "I am persuaded that faces are as legible as books, and are read in much less time, and are less likely to deceive us. I cannot recollect that my skill in physiognomy ever deceived me." This man was one of the early students of physiognomy, and, about 1800, wrote numerous volumes on the subject. His works are, as he termed them, "fragments;" they are without system; and, while they contain a great deal that is good and true, they contain much that is impractical. He has so loaded the truth with a burden of fantasy that he did not succeed in removing the study from where it had been for centuries—associated with the so-called occult arts.

The one person who has lifted it from these associations and placed it on a scientific basis, is Mrs. Mary Olmstead Stanton, whose latest work, "A System of Practical and Scientific Physiognomy," is found on the shelves of our best libraries. It comprises two bulky volumes of as solid and entertaining a piece of literature as ever came from the pen of man and woman.

In making up the facial features, the jaws and teeth play a very important part. The teeth, standing as they do as guards about the entrance to the digestive tract, tell to the thoughtful student—by their size, form, color,

texture, and relative position—not only of the physiological condition of the individual, but of the mental and moral power of weakness which have been created largely by physiological activities. Many suppose dental prosthesis requires only knowledge of abstract mechanics or merely manual skill. It is just here, however, in the preparation of artificial dentures that the highest workmanship is required. Each case involves the necessity of the possession of sufficient knowledge of the physiological and the physiognomical condition of the mouth, and skill to restore what is lost. We must first learn to appreciate nature's own work before we can expect to even approximate such perfection. From the similarity of the majority of artificial teeth, there is room in the profession for greater study and more artistic work. The closest study is needed here to correct the meaningless "horseshoe-style," so prevalent throughout the country. How often we see even, white teeth where every feature cries out against them. There are hardly two people with exactly the same facial angle and conformation. The patient's individuality should be well studied before an attempt is made to prepare an artificial denture. The temperament, contour of the face and body, the complexion, age, etc., should be considered, and the artificial denture be constructed in accordance with these physiognomical and other requirements.

Artificial teeth, as manufactured at the depots for the profession, are mere blanks that have to be—or, rather, should be—so shaped and prepared as to harmonize with the facial requirements of each patient. Take, for example, one of the sanguine temperament. We know nature gives this temperament teeth that are well proportioned—abounding in curves, arranged in a full, round arch—with an articulation that is moderately firm and corresponding generally to the contour of the face and head.

Often, to individualize the teeth, the cutting edges of the incisors must be ground to imitate wear by mastication, according to the age of the patient; the natural occlusion

being nearly on end, the front teeth are much worn away. To imitate this waste of tooth substance gives the operator a fair chance to show his skill and judgment. The cutting edges of artificial teeth, as received from the depot, are always rounded. This edge should be so ground as to give it a worn appearance. The smallest cut on the edge of each incisor and cuspid will vary the expression greatly, and give character to the teeth according to the slope given and the amount removed, rendering it difficult to recognize them as the same set of teeth.

It is sometimes advantageous to leave out a tooth on one side, say a first bicuspid, and bring the second bicuspid forward about half the width of the tooth removed, representing the loss of a tooth with the space partially closed up. Or a pleasing effect can sometimes be obtained by leaving out the second bicuspid tooth and inserting a gold crown in its place, and very natural effects be made by securing the teeth before they are baked at the depot, and carve and stain them, according to the case in hand.

Again, to restore the features it is sometimes necessary to imitate the irregularities of the natural teeth; and, as Dr. W. R. Hall has said, "This is a difficult feat to perform, seldom successful, as, when attempted, it is usually overdone, and without judgment. Crowding and overlapping gives a confused and bewildering look to the mouth, entirely contrary to the indications of most patients. Irregularities are more numerous in adults of the bilious temperament than any other, and more strongly marked, being in accordance with the rugged characteristics of this type, which is noted for its force, tumultuous passions, and energy of action; but even in this temperament the teeth must be placed and grouped together in such a way as to convey the idea of strength and energy, not a confessed jumble."

As another has well said, "If we have not ideal teeth, the probabilities are there are many other things in feature and complexion, which also are far from our highest conception;

and the introduction of ideal teeth, where the surroundings are anything but artistic, is no improvement. It creates a discordant note, and destroys the harmony which prevails even in ugliness, and makes that ugliness more evident and unpleasant. But it requires a high conception of true art to thoroughly appreciate these principles and apply them in practice. It is, therefore, not surprising to find that distinguished dentists are the constant and appreciated friends of art and letters.—G. W. WARREN, in *International*.

Editorial, Etc.

THE DENTIST A TEACHER.—It is admitted that children's teeth do not receive the degree of attention which they demand. The public mind believes that because the period of duration of the temporary teeth is a brief one, they are not worthy the care which is bestowed upon the permanent set. Children are given little, if any, dental treatment until they are about ten years old, by which time, through the ignorance or neglect of parents almost irreparable damage has been done to the six-year molars, large teeth well adapted for mastication. Physicians and dentists by statistics have shown that 56 per cent. of the upper molars are decayed before the seventh year, and that the lower molars, coming first, decay at once; 20 per cent. during the first year, and 70 per cent. by the third year, after eruption.

The number of teeth lost is now so extensive that it assumes a national calamity, for the digestion being impaired the physical stamina of the nation is injured. The evils arising from insufficient mastication caused by the loss of teeth can not be exaggerated. The dental profession is, in a great measure, responsible for the ignorance respecting the mouth and the teeth. If schools would engage the services of properly-qualified dentists, the needless loss of many teeth may be prevented. Instruction in the daily care of the teeth could be given.

"To avoid the wholesale destruction of teeth, to serve their patients' best interests, and to save themselves very many difficult, tedious and wearing operations, which at best are not always entirely satisfactory to the operator, yet are the best that may be done from the condition of affairs, many operators have lately adopted the plan of *notifying their patients when they*

should come. This plan, although it may have the look of being mercenary, or of seeking to drum up patients, is one that suits such persons who are worth having as patients, and these are pleased to have the burden of *remembering* when to go to the dentist shifted from their shoulders. It is customary then, with many dentists, to have *two diaries*, and after having completed for the patient to put his or her name and address down in one of these, at a certain *hour* and *date*, three or six months in advance, accordingly as he thinks the patients' teeth need watching.

"At the beginning of the year these names are copied in the *new diary* and *each week* postals are sent to the different patients notifying them of the day and hour of their appointment. By this plan a clientele is established, patients come regularly, their teeth are watched and extensive decay thwarted, the responsibility of their loss is, to a great measure shifted from their shoulders, their bills are comparatively light, since the amount of work, by such a plan, is necessarily small, there are few or no new cases, and often no severe toothache, so that when the plan is once established, it works to the satisfaction of all concerned."

That the subject is worthy of public attention is witnessed by recent articles in current literature. The one quoted in the July number of this Journal from *Harper's Weekly* concluded with these words: "Take it all in all, care of the teeth *pays*, in comfort, in beauty, in the conservation of health from youth to old age." The *Youth's Companion*, which enters so many homes in this country as a moulder and guide of conduct, also has an editorial which says:

"All diseases which profoundly affect the nutrition influence the development of the teeth; and since the growth of the teeth is mainly limited to the age of childhood, their condition is especially influenced by children's diseases.

"Faulty nutrition or severe wasting illness show themselves nowhere more prominently than in the development of the bones and teeth; and on the other hand good teeth in children play a very important part in producing a healthful and robust manhood or womanhood. Decaying and loosened teeth directly favor imperfect mastication and consequent indigestion.

"Indigestion favors poor nutrition; it causes the secretions of the mouth to become acid in reaction—a perversion of the normal reaction of the saliva, which attacks the teeth and favors their rapid decay.

"A case of this kind has lately been observed. A child,

naturally good-natured but "spoiled" by indulgent parents, was allowed to eat fresh cakes, expensive candies, jams, pastries. Attacks of indigestion, with vomiting of the acid contents of the stomach, supervened. The teeth softened, "became poor" at an early age.

"In order to assure such a child a healthful bodily development and protect it from the evils of subsequent attacks of indigestion, there must be something more than a correction of its diet. The teeth should be filled. This guards against disease of the alveolar process, or the bony portion of the jaw into which the roots of the teeth are inserted, against an unsymmetrical growth of the jaw itself, and against an involvement of the second tooth, just developing beneath the first.

"A regular supervision of children's teeth would save large dentist's bills, and would undoubtedly tend to a healthier, stronger race of mankind. From the time of the first appearance of the teeth through the gums, they should be subjected to a rubbing twice a day with a soft rag and lime water, until the twelfth month of infancy, when a soft brush should be substituted.

"Frequent visits to the dentist are an absolute necessity.

"Children who are allowed to eat warm bread, rich pastries, cakes and candies are almost invariably subject to habitual attacks of indigestion. The far-reaching effects of such attacks can be avoided by the prohibition of such food. Meat, not too tender, and crusts of bread are excellent objects upon which a child's teeth may be exercised and strengthened."

R. G.

NATIONAL ASSOCIATION OF DENTAL FACULTIES.

The ninth annual meeting of the National Association of Dental Faculties was held at the Cataract House, Niagara Falls, commencing Monday, August 1, 1892.

Twenty-six colleges were represented, as follows:

Baltimore College of Dental Surgery—R. B. Winder.

Boston Dental College—J. A. Follett.

Chicago College of Dental Surgery—Truman W. Brophy.

Harvard University, Dental Department—Thomas Fillebrown.

- Kansas City Dental College—J. D. Patterson.
 Missouri Dental College, Dental Department of Washington University—W. H. Eames.
 New York College of Dentistry—Frank Abbott.
 Ohio College of Dental Surgery—H. A. Smith.
 Pennsylvania College of Dental Surgery—C. N. Peirce.
 Philadelphia Dental College—J. E. Garretson.
 University of Iowa, Dental Department—A. O. Hunt.
 University of Michigan, Dental Department—J. Taft.
 University of Pennsylvania, Dental Department—James Truman.
 Vanderbilt University, Dental Department.—W. H. Morgan,
 Northwestern College of Dental Surgery—B. J. Roberts.
 Louisville College of Dentistry—Francis Peabody.
 Indiana Dental College—J. E. Cravens.
 Northwestern University Dental School—E. D. Swain.
 Dental Department of Southern Medical College—William Crenshaw.
 Dental Department of University of Tennessee—J. P. Gray.
 School of Dentistry of Meharry Medical Department of Central Tennessee College—G. W. Hubbard.
 University of Maryland, Dental Department—John C. Uhler.
 Columbian University, Dental Department—H. C. Thompson.
 Royal College of Dental Surgeons of Ontario—J. Branstons Willmott.
 American College of Dental Surgery—John S. Marshall.
 University of Denver, Dental Department—George J. Hartung.

The *ad interim* committee reported that it had investigated a charge preferred against the University of Maryland, Dental Department, by the College of Dentistry of the University of California, of graduating a person in less time than the rules demanded; that it found that no rule of the association had been violated, and had so reported to the parties in interest; that it had dismissed an effort for the reinstatement.

ment of the American College of Dental Surgery, Chicago, as not within the jurisdiction of the committee, with the advice to reorganize the college before attempting to influence the association to change its action, which reorganization has since been accomplished.

The committee also stated that its value in settling such matters had been made so clearly apparent that it recommended that it should be made a standing committee, to be elected by the association, instead of being appointed by the president.

The report was received and placed on file, and the recommendation with regard to the status of the committee was adopted.

The following resolutions, laid over from last year, were adopted :

Resolved, That in case of charges against any college no final action shall be taken until all parties concerned shall have at least thirty days' notice.

Resolved, That at all future meetings of the National Association of Dental Faculties the delegates shall consist of members of faculties, and demonstrators will not be received.

The following resolutions, also over from last year, were laid on the table :

Resolved, That after June, 1893, the yearly course of study shall be not less than seven months, two months of which may be attendance upon clinical instruction in the infirmary of the school, now known as intermediate or infirmatory courses.

Resolved, That after the session of 1892 93, four years in the study of dentistry be required before graduation.

The following resolutions lie over under the rules :

Offered by Dr. Winder,—

Resolved, That hereafter graduates of pharmacy be placed on the same footing as graduates of medicine, and be entitled to enter the second-year or junior class, subject to the examination requirements of each college.

Offered by the executive committee,—

Any college failing to have a representative present for

two successive sessions without satisfactory explanation shall be dropped from the roll of membership of this association.

The chair, having been asked for a ruling upon the admission of graduates of pharmacy to the junior class, decided that under the rules they could only be admitted to the first-year or freshman class.

The executive committee offered a report recommending the restoration of the American College of Dental Surgery to full membership, which, after an explanation by Dr. Marshall of the reorganization of the college, was unanimously adopted.

The executive committee reported on the application of the Western Dental College, of Kansas City, recommending that it lie over for one year. The report was adopted.

The report of the executive committee recommending the rejection of the application of the Tennessee Medical College, Dental Department, of Knoxville, Tenn., for irregularities in conferring the degree of D.D.S. and in the reception of students, was adopted.

The application of Howard University, Dental Department, Washington, D. C., was laid over for one year.

The following applications for membership, also reported by the executive committee, lie over under the rules :

United States Dental College, Chicago.

Homœopathic Hospital College, Dental Department, Cleveland.

Detroit College of Medicine, Department of Dental Surgery.

The report of the executive committee recommending that the Baltimore College of Dental Surgery be censured by the association for conferring the degree of Doctor of Dental Surgery upon Charles F. Forsham, M. A., LL. D., of Bradford, England, *in absentia* and honorarily, in violation of the rules of the association, was adopted.

Dr. Truman offered an amendment to the rule regarding the conferring of the degree of Doctor of Dental Surgery honorarily, absolutely prohibiting the exercise of that privilege to the members of the association, but the amendment was lost, after discussion, it being the general sense that the present rule is a sufficient safeguard against the unworthy bestowal of the honor.

Dr. Cravens offered the following amendment to the constitution, which goes over under the rules:

Amend Article VII. so that it shall read as follows:

ART. VII. Any reputable dental college, located in any State of the United States, may be represented in this body upon submitting to the executive committee satisfactory credentials, signing the constitution, conforming to the rules and regulations of this body, and paying such assessments as may be made.

The association adopted a protest against the classification of dentists as manufacturers, as provided in House Bill No. 7696, known as the Willcox bill, and against the collection of statistics from dentists under its provisions, on the grounds that dentists are not manufacturers in any sense, not being engaged in the manufacture, fabrication, or sale of any product having a merchandisable value; that all the laws heretofore passed in the various States and Territories and the District of Columbia distinctly recognize dentists as professional men; and that the attempt to collect statistics would be an injustice not only to them but to their patients, and that such statistics if collected would be valueless to the government because showing the products of a class of men not engaged in manufactures.

The following, offered by Dr. Winder, was also adopted:

Resolved. That the National Association of Dental Faculties recommends that their alumni write and demand of the Census Bureau of the United States the return of all statistical reports, as, under the recent agreement between the dental profession and said Bureau, lawyers, physicians, and dentists are exempted from making statistical reports for the census of 1890, and that a copy of this resolution be forwarded to the chief of the Census Bureau.

A communication from the Post-Graduate Dental Association of the United States, suggesting the establishment by the colleges of short courses of training and teaching especially designed and arranged for practitioners, was received and referred to the executive committee.

The manuscript of a Compend of Materia Medica and

Pharmacy for Dental Students, by Dr. E. L. Clifford, of Chicago, was referred to the committee on text-books, with power to act.

Dr. Marshall offered the following resolution, which was adopted :

Resolved, That the secretary be instructed to notify the National Association of Dental Examiners that the National Association of Dental Faculties considers it out of its province to legislate upon the relative values of the L. D. S. and D. D. S. degrees.

The following were elected officers for the ensuing year : J. D. Patterson, Kansas City, president; H. A. Smith, Cincinnati, vice-president; J. E. Cravens, Indianapolis, secretary, H. A. Smith, Cincinnati, treasurer; F. Abbott of New York, J. Taft of Cincinnati, and A. O. Hunt of Iowa City, executive committee; James Truman of Philadelphia, Frank Abbott of New York, and Thomas Fillebrown of Boston, *ad interim* committee.

The president appointed as the committee on schools Drs. J. A. Follett, Boston; S. H. Guilford, Philadelphia; E. D. Swain, Chicago; C. N. Peirce, Philadelphia; T. W. Bröphy, Chicago.

Adjourned to meet at the call of the executive committee.

MISSOURI STATE DENTAL ASSOCIATION.

The twenty-seventh annual meeting of the Missouri State Dental Association was held at Clinton, Mo., July 5th to 8th inclusive. There were 26 new members admitted, and eleven papers read.

The following list of officers and committees were elected for the ensuing year :

President.—J. D. Patterson, Kansas City.

1st Vice-President —W. E. Tucker, Springfield.

2nd Vice-President.—DeCoursey Lindsley, St. Louis.

Cor. Secretary.—Wm. Conrad, St. Louis.

Rec. Secretary.—H. A. Ruby, Clinton.

Treasurer.—Jas. S. Price, Weston.

Executive Committee.—C. B. Hewitt, Kansas City; A. J. McDonald, Kansas City; J. E. Crozier, Lees Summit.

Board of Censors.—E. E. Shattuck, Kansas City; H. A. Cress, Warrensburg; E. B. Crane, California.

Committee on Ethics.—Frank Slater, Rich Hill; J. B. Newby, St. Louis; C. L. Hungerford, Kansas City.

Law.—Jas. A. Price, Weston.

Committee on Publication.—J. E. Crozier, Lee's Summit; T. J. Frey, Moberly; C. L. Hickman, St. Louis.

Com. on New Appliances.—L. L. Hungerford, Kansas City.

Supervisor of Clinics.—C. H. Darby, St. Joe.

The next meeting of this Association will be held at Excelsior Springs, Mo., on the first Tuesday after July 4th, 1893.

WILLIAM CONRAD, *Cor. Sec'y.*

St. Louis, Mo.

Monthly Summary.

NEURALGIA.—For six months a lady, at frequent intervals, had terrible neuralgia of the shoulder, going down to the forearm. I asked her if her teeth had been examined, and she said that they had never been suspected by her physician as the cause of the trouble. I found under the free margin of the gum, on the buccal side of the wisdom-tooth, a cavity that penetrated to the pulp chamber. It was such a difficult place to get at, and she had suffered so long, I advised her to have it out, and after the extraction of the tooth the neuralgia disappeared from the shoulder.

I have seen other cases of neuralgia where, apparently, a very slight thing caused it all. I remember one case of a patient suffering with intense neuralgia, where there was no cavities in the teeth, except what had been well filled, but there was a noticeable recession of the gums, which I decided was the cause, from their hyper-sensitiveness. The exposed parts of the teeth were treated with a little nitrate of silver, which removed the sensitiveness and also the neuralgia.—*Dr. Smith, in International.*

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ARTICLE I.

ANÆSTHESIA AND ANÆSTHETICS.

BY DR. S. J. HAYES.

An address delivered to the Cincinnati Medical Society.

It is to be very much regretted that there is no other science connected with the healing art, that is so little understood, or of which there has been so little known, as the science of Anæsthesia. True, there has been no *great dearth* in writing up the subject, but what has been written, is mainly historical, and principally a rehash of what others have said or done, without a proper investigation into cause and effect. And yet, no one dare question but that to *relieve* from the agonies of pain and to render comparatively easy and safe *delicate* and *intricate* surgical operations is certainly the most *gracious boon* that can possibly be conferred by the Medical and Dental professions upon suffering humanity. That which lays at the very foundation of the study of this science, is a knowledge of the constitution of the nervous system, its *organic structure* and the laws by which it is regulated and

governed. This is most certainly manifest, in that we *must* deal *primarily* and *all the time* with this most intricate and yet marvelously delicate organic structure, in which there is such a wonderful range of difference, the powers of endurance so *varied* and so widely, and yet, strangely differing, that it is simply *incomprehensible* and *inexplicable* with our limited knowledge of this structure. Yet, we may know something of its constituency, the laws in relation thereto and the functions of life, and the more we know, the better we are qualified to prepare and adapt agencies to produce anæsthesia safely, pleasantly, effectually and without unpleasant after-results. I shall not now attempt to depict by diagram or chart the organic nervous system, leaving that to other and more capable hands, but I desire to call your attention to some of the laws relative to its constitution and functions, which are of *most vital importance* in relation to anæsthesia. For, mark you, anæsthesia is *not* simply a condition in which there is an *absence of sensation* as it is usually defined, but a condition in which the force and functions of life are in continuance, under modification, induced by medico-chemical agencies. And just here, I prefer to have it understood, that while I am speaking didactically, I do not speak authoritatively, and much prefer to express my own thoughts rather than the thoughts of others, more beautifully expressed, knowing full well that you will be capable of separating and gathering in the wheat and rejecting the chaff. Authority is a very good thing, and will assist in developing the arts and sciences when *right*, but when *wrong*, it is a very great evil, and materially retards the development.

While oxygen is the force of life, or that out of which *vital force* or nerve-vital fluid or animo-electricity, is generated by the pulmonary glands, yet it is not life itself. Life is an imponderable agent located in the organic nervous system which requires oxygen to make manifest the operations which characterize life, respiration, circulation and animal heat. It is believed, that life is imparted at the

instant the semen is emitted. Life may continue dormant for a number of days, as will be seen by persons laying in a trance, apparently lifeless, yet again, having resumed the functions of life. Persons taken from out of the water, to all appearance lifeless, and without any manifestation of functional life, have had respiration, circulation and heat established. A frog may be frozen to represent an icicle, and yet when thawed, it will leap about sprightly. Thus it will be seen that while we may not be able to describe life for lack of its physical characteristics, we must recognize it as an *independent power* or agent capable of holding possession of its abode in the organic nervous system for a limited time, independently or without the presence of either the oxygen, or the blood. This is fully established by the fact that life will remain in the organic nervous system quite a while after all the blood, and consequently oxygen has been removed. Life being an invisible imponderable agent, or power, under whose guidance or force all the complicated organizations of man carry on their functions, and being located in the organic nervous system, only requires oxygen and blood to perform all the wonderful phenomena of life, and display its wisdom.

The heart and lungs are regulated by the cardiac and pulmonary ganglions and the pulmonary glands, secrete animal electricity or *nervo-vital* fluid. This is demonstrated beautifully in the evolution of electricity by the torpedo. That the pulmonary organic glands are capable of generating or giving off animal electricity or vital fluid by the entrance of air into the lungs, and its passage through the glands and union with venous blood, is clearly manifest in this peculiar species of the finny tribe. The partitions of the electrical column are covered with a fine net-work of arteries, veins and nerves. They are very vascular, sending inward from the circumference, all around on each partition, small arteries which anastomose upon it, and passing also, from one to another, unite with the vessels of

the adjacent partition. Goldstream says: The nerves of the electrical organs of the Gymnotus are derived from the spinal marrow alone. They are very large and numerous, and are divided into very fine twigs on the cells of the organs. There is a wonderful similarity in a section of the electric organ of the Torpedo and Gymnotus and a section of the lung. The sections of both organs are furnished with arteries, veins, nerves and cells. Both these organs are amply supplied with animal nerves derived from the spinal chord, and therefore the medulla is continuously supplied with this nerve-vital fluid, and is the seat or reservoir of *vital force*. This vital force, or nervo-vital fluid, is sent out from the medulla through the nerves at the behest of life itself.

Thus it will be seen, that by the union of oxygen with the pulmonary glands and venous blood, the functions of life are made manifest as characterized by respiration, circulation and animal heat. Therefore, it follows, that whatever has a tendency to weaken or strengthen the action of the heart, will accordingly effect the temperature of the body; and also, whatever depresses or excites the nervous system, weaken or strengthen respiration, and the functions of the heart, that being the result of the evolution of electricity or nervo-vital fluid by the pulmonary glands, and the union of oxygen with the blood, which latter can only be effected by the evolution of animal electricity as evolved by these glands and the cerebral glands of the brain. Consequently, as you suspend or cut off the supply of free oxygen to the lungs, the pulmonary glands cease to generate and furnish *vital force*, both to the nervous system and to the blood. The *safety* and *continuance* of life depends upon a sufficient supply of *free oxygen* to furnish sufficient vital force to sustain the functions of life. If it be true, that anæsthesia is *only* a condition in which there is an absence of sensation as it is usually defined, then either asphyxia, syncope, paralysis or death would be anæsthesia, as in these conditions there is

an absence of sensation. Yet, no sane, well-informed man will ever want either of these physical conditions for a safe surgical operation. Words are employed to represent ideas, and they should represent them so clearly that there be no confounding nor leading astray by their use. I should say that anæsthesia is a physical condition differing *radically* from every other, in this, that in this condition the forces and functions of life, must be in continuance under modification—modification induced by medico-chemical agencies—suitable narcotics, whereby an absence of sensation is attained. The force of life, being oxygen in a *free* state without which *you* cannot produce anæsthesia, it is the all important element in your anæsthetic. Free oxygen is oxygen, *not chemically combined* with any other chemical element, but simply in a state of mixture as found in the atmosphere. The moment you combine it chemically as in Nitrous Oxide Gas (N_2O) it loses its properties and functions. This is in accordance with the fundamental law of chemistry which is more binding than the laws of the Medes and Persians, because it is founded in nature itself and is as eternal. Consequently, agencies that do not contain free oxygen, such as the numerous preparations from methelic or ethelic alcohol, as Ether, Chloroform, etc., are not anæsthetics for the reason that they do not contain oxygen in a free state, but are simply suitable narcotics producing exciting sedative, soporific or iodide effects, depending upon the state of administration. Therefore, it will be readily seen, that you make your anæsthetic when you use any of these narcotics and that the narcotic preparation is simply a modifier and the subordinate element in your anæsthetic. You may modify by a super quantity of oxygen in a free state, which you have by rapid inhalation and which produces a toxicological effect upon the nerve centres and by which you may produce anæsthesia in some persons, sufficient to perform a minor surgical operation without incurring pain. However, your suitable narcotic is not only a

convenience, but very necessary as a subordinate element in your anæsthetic. Yet, you must have sufficient free oxygen to furnish the red corpuscles in the blood and to sustain life without which you cannot have anæsthesia but will have asphyxia and you may have death. Asphyxia can *only* be produced by suspension, abrogation or cutting off of the force of life (oxygen in a free state) and then when you do not have sufficient force (free oxygen) to eliminate the narcotic from the blood and system, your patient sinks and gradually loses the functions of life and then all the powers of earth cannot resuscitate. Unpardonable and outrageous errors have been committed by many writers on the subject of "Anæsthetics and Artificial Anæsthesia" in confounding mere asphyxiating agents with true anæsthetics, and in not recognizing and representing the marked difference both in their properties and functions as well as in their effects.

Asphyxia is the natural and legitimate result of depriving the blood of oxygen in its simple and chemically unconnected form. Anæsthesia is a state of insensibility induced ordinarily by narcotizing the patient with a suitable narcotic while sustaining the force and functions of life, with this life-giving principle. Therefore, while insensibility is an attribute of asphyxia as well as of anæsthesia, yet they are radically different and diametrically opposite in their tendencies and results. The former may be properly designated as "the first step in at death's door," while the latter is the happy state of *insensibility* with the possession of the forces and functions of life. The failure of Nitrous Oxide ($N_2 O$) Carbonic Oxide ($C O$) or Carbonic Acid ($C O_2$) or any other similar inert gas to sustain respiration and life, is not attributable to a lack of oxygen in them as they contain a greater quantity of oxygen than the atmosphere, but that the oxygen and nitrogen or carbon in the gases are in *chemical union* and that the affinity of the oxygen for the other gas, is greater or stronger than the affinity of the blood for the oxygen

and consequently the blood cannot appropriate the oxygen and, therefore, these gases fail to support life. In the atmosphere ($N_4 O$) these gases are in a state of admixture, not in chemical union and therefore the oxygen readily enters the blood to sustain life. And since pure undiluted oxygen is too irritating and exciting to sustain life without detriment and since as it is found diluted with nitrogen in the atmosphere, it is readily appropriated and meets the wants of life perfectly, and since when found in any other condition or combination and appropriated, it always endangers health and life, the use of Nitrous Oxide, Carbonic Acid or any other asphyxiating agent for the pretended purposes of producing anæsthesia, should be prohibited by appropriate legislation. In fact, these agencies antagonize life from the first inspiration. And a cat or a dog, or a man will cross over the death line when the exclusive use of Nitrous Oxide Gas or any other asphyxiating agent, has so weakened the affinity of the blood for oxygen that it cannot appropriate the oxygen when the air is admitted to the lungs. And although, thousands have taken this so called "Laughing Gas" without apparent injury, yet, it antagonizes life from the very first inspiration and no man, however strong, can be deprived of sensation by the loss of *vital force* without some injury in some way to his nervous system. The loss of *vital force* and *neural energy* in many have resulted in consumption and insanity, or both. Hence, the use of asphyxiating agencies, as Dr. Richardson says, "should be prohibited by law." But when an anæsthetic is inhaled, the narcotic element passes into the lungs with the oxygen, the narcotic is thus communicated on the union of the oxygen with the organic glands and simultaneously into the glands and the organic ganglions and into the venous blood. The narcotic agent is thus conveyed into the nerve tubules which enter into the organization of the ganglions by their connection with the organic glands and the vascular membranes which surround the ganglions.

Thus, the formation of the ganglions, are interfered with and the superior central ganglion and the cerebral glands are placed in a *quiescent state* and cease giving off this *nervo vital fluid* to stimulate the nerve fibers of the brain and the mind ceases to act, or acts *feebly* and sleep is the result. The narcotic element is also communicated to the external, middle and internal coats of the arteries by the arterial blood. It is still further conveyed to the muscular fibres by their connection with the capillary arteries, causing their relaxation and ultimately interfering with the action of the pulmonary glands which will only occur when you have an over-percentage of the narcotic element in your anæsthetic.

Before a person is fully anæsthetized, he gets apparently drunk. This is caused by the confused action of the brain, consequent upon the irregular and interrupted secretion of the *nervo-vital fluid* by the cerebral glands.

Having described the channel through which the chemical and mechanical effects of anæsthetics, are produced upon the nerve centres which may be denominated the secondary or remote effects; I will now speak of the immediate or primary effects upon the nerve centres, the nervous system and their relations to the functions of life. The axiom—"never a result without a cause" must be borne in mind. When the statistical reports of deaths from the use of chloroform, ether, etc., show that the most of the deaths have occurred in the first stage and in the hot season of the year, we inquire for the cause. In so doing, we ascertain that the anæsthetics are introduced into the system very much as electricity is introduced, namely, through the *sensory nerves*. The pneumo-gastric nerve extending into the lungs, and stomach, is principally a sensory nerve. The sensory nerves communicate from without to within the system, or from the periphery to the nerve centres, and the *vassomotor nerves* from within to without, or from the nerve centres to the periphery. There is a circulation independent (and yet not independent) of

arterial and venous circulation. The circulation of a substance within the nerves, which for want of a better name, we call *nervo-vita fluid*. This is the medium of communicating intelligence to the nerve centres and power to the physical organs, whereby they are enabled to perform their functions, and without which there can be no *neural force* nor *physical power*. Consequently, not a function of life can be performed when this circulation stops. As the functions of the lungs and the heart, as well as every other organ, are performed at the demand of the medulla and the behest of life, when the circulation of this vital fluid in the medulla is suddenly arrested by the abrupt introduction of an over quantity of electricity, or an over percentage of a powerful narcotic, such as chloroform, or by a sudden action of the mind in an extremely delicately, nervously constituted person, you have *concussion*, *revulsion* in neural circulation and paralyzation. There are two agencies operating upon and through neural circulation and neural force—the one internal, the other external. The former, we denominate intellect, the latter, *chemical* and *mechanical* and these two agencies produce similar effects.

By a sudden, startling action of the mind as by the sight of blood or fright or sudden death, revulsion in neural circulation in the sympathetic pneumo-gastric nerve in the stomach, is produced and nausea is the result; a little later on you have its *reflex* in the medulla a partial paralysis, and you have syncope. Or the action of the mind may be so quick and *powerful* that a terrible concussion, revulsion and paralyzation is the result, sometimes producing death. The latter condition is frequently produced by the sight of a revolting death, or by the sudden breaking of *very sad news* to an extremely delicately nervously constituted person, such as the sudden and terrible death of a very near and dear friend. This is a sudden *arrestation* of the circulation of the *nervo-vital* fluid in the medulla, and when this occurs every function of life suddenly ceases. The very same effects are pro-

duced by the external agencies. The sudden introduction of too great a volume of electricity or an over percentage of the narcotic element in an anæsthetic or *severe pain* (which is mechanical) will produce nausea, syncope, paralysis or death. If you have the functions of life cease at one, two, three or four inhalations of chloroform, or any other narcotic, you have simply paralysis from a sudden induction of an over percentage of the narcotic in your Anæsthetic. If you generate and introduce electricity in close observance, and in accordance with the laws of nature, your patient will receive it kindly, and you will not have fatal results. You commence the induction of electricity—after placing the poles of the battery in the hands of your patient—by turning on a very light volume, and then increase the volume as your patient is capable of receiving it. By so doing, you stimulate neural circulation *gradually*, and thereby increase the capacity to receive without producing concussion or paralyzation. In this way your patient is prepared to receive and retain a much greater volume of electricity than would have produced death had it been suddenly inducted. Fill a Leyden jar with this subtle agent and let it into a man all at once, and the functions of life will instantly cease. But you can fill fifty jars with electricity and turn it into him gradually on an insulated stool without injury. If he has a hat on his head it will likely tumble off, and his hair will stand up like the quills of a porcupine; but if he does not know what you are doing, he wonders that the hat and the hair behave so strangely, yet if it pass out of him gradually he is none the worse for it. Just so in generating and applying anæsthetics. If you generate and induct an over percentage of your narcotic element *suddenly*, especially if it be a powerful drug such as chloroform, you will likely produce a *shock* or concussion in the medulla of an extremely delicately, nervously constituted patient, in the first, second or third inhalation. This result is not produced by your narcotic through arterial and venous

circulation, as is generally taught, but by the chemical action of the narcotic upon the nerve centre and through the sensory nerves. It is estimated that an ordinary sized man has about 1,400 square feet of surface in his lungs, over which the pneumo-gastric nerve, with its tens of thousands of nerve filaments are spread out, ready to apprehend and receive your anæsthetic as it is introduced. If your narcotic happens to be chloroform (for instance), of which it has been estimated by the Royal Medical and Chirurgical Society of England, that $3\frac{1}{2}$ per cent. is sufficient for the average patient, 6 per cent. is dangerous and 12 per cent. is almost sure to produce asphyxia, plus-narcotism and may be death, and if your patient happens to be the delicate one previously described, and if you, instead of commencing the introduction of your anæsthetic with about one or two per cent. of the narcotic, *abruptly* commence with about 30 per cent., do not be surprised at your fatal result. You have violated nature's laws and must abide the consequences. You should be prosecuted for *mal-practice*, and suffer the penalty of your crime.

But if you commence the induction of your narcotic with about one per cent. and then increase the percentage just as your patient kindly receives and tolerates it, you will *never* produce concussion or paralyzation. But deaths sometimes occur in the latter stages of anæsthesia, and yet not without a cause. If you have a death from the secondary effect of your anæsthetic, it is produced by over-crowding the blood with the narcotic element, so as to crowd out the necessary quantity of free oxygen to furnish *vital force* sufficient to eliminate the narcotic and to sustain life. Therefore, when you have a death in what is known as the third stage of anæsthesia, you always have asphyxia first; and when you have it so profound; or have reduced the quantity of free oxygen in the blood, so that there is not sufficient *vital force* to eliminate the narcotic, your patient sinks and is soon irrevocably dead.

Hayes Process of Generating and Applying Anæs-

thetics, with the appropriate Apparatus removes the cause of these fatal results by regulating the pro rata or percentage of the narcotic in the anæsthetic, so as to not only know *positively* about how much of the narcotic is in the anæsthetic at every stage of anæsthesia, but to regulate the same so as to *adapt* it to the kindly tolerance of the patient in all the various stages of anæsthesia, and thus prevent a "*shock*" or concussion and paralyzation in the first stage of administration, and asphyxia and death in the latter stage. Nausea and vomiting are frequently unpleasant results in the administration of chloroform, ether, etc., by the ordinary methods of administering. This is caused first by the deposition of the globules of vapor into the buccal fluids. These also irritate the fauces, epiglottis, mucus membranes of the bronchial tubes and air cells of the lungs. Hence, if you *destroy* these globules of vapor, you will obviate these unpleasant results, which is done by the Hayes Process and Apparatus by friction in the production of counter currents of air within the Generator. Another frequent cause of nausea, is the sudden introduction of an *over-percentage* or undue quantity of the narcotic element, which produces *revulsion* in neural circulation in the sympathetic *pneumo-gastric* nerve in the stomach, very similar to that which is caused by violently striking this delicate organ. Therefore, if you will generate and apply your anæsthetic by destroying the globules of the vapor, and regulate the percentage of the narcotic element in the anæsthetic, so as to adopt it to the kindly tolerance of the patient in all the stages of anæsthesia, which is accomplished by the Hayes Process and Apparatus, you will neither have *nausea* nor *death* resulting from your anæsthetic when using a suitable narcotic as the subordinate element. Many physicians and dentists think an abnormal condition of the heart, or what is commonly known as organic heart disease, or inflamed bronchi or lungs, forbid the use of anæsthetics. This impression has been extended and confirmed by the notorious fact that the

heart, the lungs and the brain have been made the *scape goat* for many a man's just punishment for his criminal mal-practice in the use of the so-called anæsthetics. When a death occurs a friend is sought to conduct an autopsy; he selects a few of his medical friends, whom he can readily influence, and they proceed to investigate the heart, the lungs and the brain, and when through with the *post mortem* examination, they announce that they found clots of blood in the heart, and that there was evident valvular disease of that organ; or that they found a congested condition of the brain, the arteries contracted and evidences of embolism, and that the death occurred from the diseased condition of these organs. Now, I submit to your intelligence, whether even alcohol, much more sulphuric ether, chloroform, etc., will not produce a congested condition of the brain, contract the arteries, and produce evidence of embolism, and whether you are not likely to find even in the heart of a slaughtered beef, clotted blood, much more so would you find clots of blood in the heart of any animal from whom the blood has not been previously taken. Such autopsies may suffice to shield the character and reputation of the perpetrator, or the man himself from his just punishment for mal-practice, but I protest against its being received as a scientific investigation of cause and effect. If the heart is diseased what is the cause of the specific disease? If the left or right mitral valve drops strokes, we find that there is a remittant flow of *nervo-vita* fluid in the moter nerves of these valves. If there is dilitation or fatty degeneracy of the heart, it can invariably be traced to an imperfect circulation of the *nervo-vital* fluid in the nerves of the muscles of the heart. But if you induct your anæsthetic in the manner here described, you will not interrupt neural circulation, and the functions of life, will be in continuance, and you have anæsthesia safely produced.—*D. & S. Microcosm.*

ARTICLE II.

HEMORRHAGE AFTER EXTRACTION.

BY A. A. BURNS, L. D. S., SMITH'S FALLS, ONT.

Read before the Eastern Ontario Dental Association.

In this paper I do not purpose dealing with any minute physiological state of the blood or tissues, but more especially to recall to the mind the ready and effective methods of arresting an undue flow of the blood after the extraction of a tooth. It has been stated that the appearance of a patient will be a key as to whether there is a likelihood of any hemorrhagic trouble. After taking due notice of the above, very little warning is given the surgeon from this source.

About the only correct warning is when the patient informs the surgeon of a trouble of this nature on a previous occasion. When a case of this kind is presented, it is well to take every precaution when performing operations of a similar kind for any members of the same family, as the trouble is said to be hereditary, and good grounds are presented from past experiences for so believing.

After a tooth has been extracted, the blood comes spontaneously and flows for an unlimited time in a degree such as will not cause any alarm. Usually after five minutes' flowing there is a process of clotting taking place. This stage in the flow of blood is called primary hemorrhage, and is usually all that the surgeon has to deal with, as the blood generally stops flowing as soon as the clot is formed; but sometimes after the clot has formed, even eight or ten hours after, there appears a flow of blood more rapid than the preceding and in a somewhat pulsating manner. This is known as secondary hemorrhage. When this occurs, it is first advisable to remove the clot which has formed in order that a more definite application may be made.

Some surgeons advise the use of a large burr as a first means of arresting the hemorrhage. The burr is passed up the socket and then given a half turn. This carries out, to an extent, the Torsion method of dealing with hemorrhage. But while this may be all sufficient, it is open to doubt, as frequently the blood comes from the underlying portion of gum, and should this be the case, the foregoing method would fail.

What seems more practical is to take a strong solution of alum, formed by dissolving alum in warm water, and first applying with a syringe; after a few applications in this manner, pellets of cotton may be saturated with the solution and forced into the socket. Some think that a greater effect is produced by applying powdered alum to the pellet after saturation. This may make the action more powerful. However, if this not effectual, it is well to repeat the treatment; or should we prefer another treatment to this: the wound may be syringed with peroxide of hydrogen, which is said to have an immediate action causing a clot which is not soluble in the blood. Pellets may also be saturated and inserted into wound.

While the patient is being treated, it is well to lose no time as patient is growing weaker, and the blood is losing its clotting action on account of one of its exponent parts, namely, the serum becoming greater in proportion, displacing the organic matter. If none of these methods are successful, the stronger styptics must be resorted to.

The following are classed among the more powerful styptics for local application: Nitrate of silver, tannic acid, subsulphate of iron, perchloride of iron, persulphate of iron, gallic acid, tincture of ergot. Care must be taken so that no agent is employed as a styptic which will in any way destroy the tissue.

Nitrate of silver may prove successful in some cases, but it causes destruction of the tissues with which it comes in contact, and also forms a clot which is soluble in blood. Perchloride of iron acts in much the same manner.

DEPTAL

Persulphate of iron is the best of the iron compounds. It acts readily, does not destroy tissue, and after action presents a clean looking wound.

Tannic acid is an excellent styptic, and answers well in connection with a compress of lint or cotton. Also gallic acid. The clot formed by these is not soluble in blood.

Powdered subsulphate of iron used on pellets of cotton saturated with sandarac varnish, followed by the use of the compress so adjusted as to act directly upon the mouth of the bleeding vessel. This is generally effective in alveolar hemorrhage.

Tincture of ergot is also good, but must be used hypodermically in about the proportion of one part ergot to two parts water. It is found that when the tissue has been punctured by the needle it presents a dark, swollen and unsightly appearance. During the time that operation is going on, it is well to see that the patient rests, and is in the horizontal position, having the head and shoulders raised. It is well in severe cases to treat other ways than locally. Arterial sedatives should be administered, such as opium one grain, and acetate of lead two-third grains. Opium should not be administered in this quantity more frequently than once every three hours, and then as few times as possible.

If it is found necessary to resort to other means, the following might be of use: Take a piece of compound, and having heated it place it upon the jaw directly opposite the wound. Have patient close jaw, and in order that they do not meet closely, it is advisable to place two little blocks of wood in the compound before inserting; when this is properly hardened, it may be removed. The part of compound which came in contact with the wound should now be removed, leaving only a sufficient quantity to serve as a division between the jaws.

Take a quantity of plaster of Paris, and mix it to the proper consistency, using alum water for the purpose. It

is necessary to hasten in doing this, as the plaster when mixed in this manner hardens quickly. Fill the cavity recently formed in the compound and place again on the jaw requesting the patient to close as before, and then having bandage ready pass it under the chin, allowing the two ends to meet over the head, where they are securely fastened. In this manner the jaws are caused to remain in a fixed position.

In any treatment it is well to leave local applications, such as pellets of cotton, compress, etc., in position until there is not the least danger of a recurrence of bleeding. Some even go as far as to allow the pellets to remain in until they are thrown off by nature.

While the object of this paper has been to try and throw out a few ideas for use in any case of severe hemorrhage, if you will permit, I will spend a few minutes in the general treatment after every case of extraction.

I consider it best to syringe out the wound until a sufficient quantity of acid has flowed from wound, and endeavor as far as possible to carry this out. It will be found that if a slow stream of cold water is poured upon the bleeding tissue with the aid of a stringe, the blood will almost immediately cease flowing.

While the treatment may be somewhat heroic in general practice for winter, it might be more agreeable to patient to dispense with the above. As a substitute take carbolic acid and glycerine in proportion of one to four, and in about a quarter glass of tepid water; drop from six to ten drops. This will be found to be equally as effectual as the other.

Some patients are given to what may be called continuous sucking of the wound immediately after a tooth has been removed. Others keep up a constant spitting. Blood is found to clot more quickly when allowed to flow of its own free will, so that either or both of the above actions are a great hindrance to *nature's* method.—
Dominion Dent. Journal

ARTICLE III.

A PLEA FOR THE PRESERVATION OF THE
NATURAL TEETH.

BY W. PEARSON, L. D. S., TORONTO, ONT.

Read before the Ontario Dental Society, Toronto, July, '92.

The Committee on Programme have assigned the above subject to me for a paper. Had they asked me to choose a subject for myself, this certainly would not have been the title. It never would have occurred to me that there existed a disposition to remove natural teeth, to the extent that any special pleading in their behalf would be in good taste or called for. That they have done so leads me to think that there is a necessity for something to be said on the subject. Where it exists, why it exists, and to what extent, I am at a loss to determine. There may be a few, one or two, perhaps a score of dental surgeons in Ontario who need reconstructing. That there are many I do not believe. In all learned professions there will be found some, whose interpretation of the meaning of a word or the sense of a phrase is very different from the generally accepted idea. So we may have those among us who do not exactly grasp the meaning of the word dentistry, more particularly the symbolic combinations of L. D. S., D. D. S., or M. D. S.

That there should at the present day appear to be a necessity, that there should exist an idea of the necessity for a plea for the preservation of natural teeth at this stage of professional progress, is to abandon the whole status and retrograde forty years or more, to disband the profession, as it were, to throw the fat into the fire and call ourselves failures, and we ought to seek some other honest calling in which spheres of usefulness may open up to us; in pursuit of which a just appreciation of our

endeavors may be looked for. Is not the sum and substance, the life and vigor, the brains, the whole physical being of the profession, a concentration and embodiment of the principle of the preservation of the natural teeth? To say anything else is a giving away of the fundamental principles.

I apprehend that thirty years ago there did exist a state which, viewed by the light of the present scholastic training; was a deplorable era, marked by the blood of thousands of slaughtered innocents, and might be termed the age of slaughter: in which time the profession was made up of broken-down tradesmen and mechanics, bounty jumpers and refugees from foreign parts, farmers and furriers, plumbers and tinkers, who, for a monetary consideration and six months' service, were turned loose on the community, and permitted to pursue their course according to the light that was in them, and everything was good grist for their mill. Happily, law and order has prevailed over this state of things, and the profession and people are protected.

If I were to say that the practices that then prevailed do now exist even in remote districts to any great extent, would be a-begging the question. I do not believe so. Yet I am led to believe by the action of the committee in the choice of this subject, that there does at the present day and generation, exist somewhere in Ontario one or more of those fossils, or perhaps pupils of the extinct race, who believe that their mission is to mutilate humanity from mercenary motives. I do not expect to teach them any better, that would be too much to expect of them, for as a rule they do not attend conventions since they know it all now. It is far easier on their conscience to stay at home and feel right than to learn better and not be able to do better. The only hope we have of them is that they will soon die and make room for civilized and enlightened beings to take their places.

Where do these people exist? Do we find them in

country places, or in the towns and cities? or why do they exist? There must be some demand for them, or do they create the demand? I hold the idea that every graduate in dentistry is by virtue of his qualification an educator. To the extent of his interpretation of the technical teachings of his college days, he must be responsible for his acts and manipulations, which must be reflected in time by the community either to his credit or damage.

If by a careful consideration of a certain case a satisfactory conclusion is arrived at, and a monument of skill and durability is the result, he has commenced to educate the community to his advantage. So according to his leading may he expect to find his patrons following, and if we find an isolated community given to false teeth, the chances are that the dentist is a rubber worker. In large communities we find all sorts and conditions of humanity, the rich and the poor, the educated and the ignorant, those from the rural districts and the city-bred; these call for different classes of the profession to deal with them. They differ in tastes and inclinations. One has the idea that false teeth are the perfection of life, another has a longing for lots of gold to show. Many let their teeth decay because it is cheaper to do so, and so on all through. There is a difficulty here in discriminating conscientiously, and yet there ought not to be. In rural districts, perhaps to a greater extent than in cities, the dentist may reflect his ideas more upon his patrons, for if he is the only representative he may be firm and decisive, argumentative and convincing in just the degree his inclination leads him. If he is an artist in rubber, false teeth is his line of argument, and I am afraid that frequently this result is from inability or indifference, and sometimes, perhaps, from the financial standpoint of the patient, and not from a correct measure of the state of the teeth. I apprehend that there is a tendency all over the country for improvement on the old method of sacrificing natural teeth, both on account of the effect of the superior education at present

obtainable at our colleges, and the higher attainments in matriculants, and the good taste and ability to indulge it by the prosperous farmers and artisans, making up the various communities, and aside from individual cases which prove very little, there is a decided change for the better in the way of saving natural teeth.

It does not come within the province of this paper to discuss ways and means of saving teeth, or of the advisability of doing so under exceptional circumstances. These points are left to the superior judgment and intelligence of the conscientious operator to decide. What the writer expects to do is to introduce the subject from a personal standpoint, and invite discussion and criticism, and thus lead up to a consideration of the many points involved. The subject is so wide, so big, so important, that a whole week could be spent on it, and the whole range of the curriculum gone over from Genesis to Revelation, in consideration of means to be adopted and ways to be pursued in saving teeth.

Let me ask you a question here, and let each one of you be prepared to give me an answer of some sort. I know each one of you will have an answer, and each one perhaps a different one, according to his personal practice, subject to local and personal qualification. The question is, When am I justified in using the forceps? Is it in the case of the temporary teeth? No, decidedly not; not under any circumstances, until the age of the child indicates that the time for action has arrived, and which to my mind is not until the new tooth is ready to take the place of the old one. More harm may be done at this age by premature removal than by delaying too long. Judicious treatment and filling (if possible) is always to be resorted to. Have a mind of your own and a policy to pursue and carry it out, and take the responsibility on your own shoulders without regard to parental or childish whims. In removing these teeth I have fallen into the habit of operating chiefly with my fingers or by an in-

cidental application of a probe or excavator, and very seldom indeed resort to forceps, rather preferring to wait until such times as they are not a necessity, and prefer leaving roots until the full time for the new tooth to appear in a few days after operating. Is it in the case of the sixth year molars that I am to begin my maltreating practices, to do evil that good may come of it? This is my opinion in a general way of removing sixth year molars. To make a quotation for the occasion: "To be or not to be, that is the question. Whether it is better to suffer the stings and pains of outraged nature and present troubles, or to take up arms and fly to the evils that we know not of." No dentist is able to determine what is going to be the result of premature extraction of a sixth year molar upon the undeveloped maxillary. The facial derangement is more than he can foresee.

After years of careful observation and study of many cases in regulating by myself and others, where these teeth have been sacrificed and where not, I am strongly convinced that there is an injudicious and wholly unnecessary sacrifice of good teeth here. I shall have to admit that once in a while a case is presented where extraction is advisable, but this is the exception, while too many make it the rule.

It is the shortest way out of a difficulty, the easiest way to settle the question. No account of the future years of lost usefulness, no consideration of facial expression, of the possibility of a contraction of the maxillary, or of a deviation from the plane of the grinding surface of the future arrivals enters into the consideration. It is simply expedient to extract and that ends it for the time being. No ghosts of the slaughtered innocents are likely to arise to trouble the conscience or rob us of innocent repose. Notwithstanding all this the principle is wrong. Conceived in ignorance and born in iniquity, it is practised too much and ought to be discontinued. Nature never provided a more fitting object for man's

good, at a more opportune time, in a better place, than this same tooth, and am I, the learned and intelligent fellow-being who, by choice in a scientific specialty, is referred to by reason of my standing and experience, justified when I say I can do nothing but extract? I think not. Or does it justify me when I say, "Oh, yes, I might perhaps do something for you. I might save the tooth for a few years, but ultimately you may lose it. You had better lose it now and later on you won't miss it much." This looks like prostitution to me, and I prefer to save the semblance of a sixth year molar, at all events for a few years, until nature provides another to take its place to carry on the great work for which they are so vitally essential, which you all very well understand, and so much longer as skill and modern advanced dentistry may enable me to.

Use your skill and resources on these teeth without regard to remuneration or desire of the patient. It does not excuse you to say that it is ulcerated or the nerve is dead, or that the patient is poor, or ignorant, or unappreciative. Save the tooth and put it down to charity, which may cover a multitude of sins otherwise laid up against you. As far as individual cases of extracting are concerned, as they are presented to the dentist for relief from present pain, and where the denture is not the immediate question. I apprehend that there is no difference of opinion, that all modern operators do make an attempt, and generally successfully, to save such a case. The point of debate and hesitation is generally when a few of the teeth are in need of treatment, or in case of a few good ones remaining, and the others more or less involved in doubt as to the advisability of attempting their salvation. In the light of present progressive dentistry, we can scarcely be excused in our action if we recommend a resort to extraction, except in cases of badly wasted roots. I hold a strong prejudice against removing even sound roots, preferring to fill them where they cannot be

crowned, and protecting the soft tissue and upholding the alveolus as long as possible. A sound root may be serviceable for years, especially so after treatment and filling or capping.

Looking at the æsthetic effects of removing teeth and restoring by the factory-made article, I presume that many will consider me wild when I make the assertion, that it is a physical impossibility to restore or reproduce the natural expression to a face when once the roots of the teeth are removed. Yet, I make the statement, and challenge the artist in dentistry to get up and say so. It cannot be done.

The canine eminence cannot be prolonged on the outside of the maxillary sufficiently high, without interfering with the free action and motion of the lips. As soon as the six anterior teeth are removed, there begins a change in the body of the jaw as well as the alveoli, too high up for any outside artificial contrivances to be placed for the comfort of the patient.

It may be possible that this is the reason why our English brethren do not, as a rule, remove the roots in substituting the natural teeth; and, if so, I commend them for their good taste, from an artistic point of view, while from a sanitary or economic point, perhaps there is not so much to be said in its favor.

My faith in the dentist of the present and of the near future is unbounded, as to their action in regard to saving teeth. Everything is promising, their inclination is in that direction, their education is directed in that way, public taste is being directed more in that way, humanity calls upon them to do so, progressive ideas must prevail, and the time is coming when the forceps will be a quarterly or semi-annual issue, instead of a daily. This will be brought about by honest, intelligent application of ways and means of treating and preserving the teeth. Honest endeavor and individual enterprise will help the public to see the folly of making needless sacrifice. Honest dentists will help to make honest and intelligent patrons.

Intelligent patrons will demand the best of service, and if honest to themselves and the profession, they will not be rummaging the newspapers to find the Cheap Johns who advertise eight dollar teeth (and gas free until the first of the month). Unfortunately for both the public and the profession, the curse of dentistry of the present day is this demoralizing system of advertising cheap work.

If I were to be told that a party had administered, on an average, gas six times a day, for a whole twelve months or two years, I should unhesitatingly say that that party was a conscienceless humbug, and was not practising dentistry at all, but prostituting a noble calling for filthy lucre. No doubt would exist in my mind that hundreds of good teeth must have been removed to be substituted by china store teeth.

This difficulty is difficult to regulate and can only be done by a firm determination upon the part of each and every new graduate to live up to the standard of professional etiquette, and adhere to the moral code of ethics, so generally understood if not always expressed.

A personal sense of honor and right pervades every properly constituted gentleman, and while he obeys this better instinct there is not much need for a written code to be placed before him.

There is much need in this country, in all countries, for advanced, scientific, conscientious dentists, who are willing to climb the hill of fame step by step, and by carefully laying the foundation of success upon correct principles, build up a reputation which will be lasting and enviable, but it can never be done on the line of false teeth, nor by printer's ink. If you know of any young man, graduate or undergraduate, bursting with ambition to do it all, given to big head, capable of running the whole concern, without much moral restraint and no conscience, utterly selfish, for whom the world was made and without whom the earth would be a desolation, you might advise him to put money into ink slinging and cheap teeth for

his theme; but to any of my hearers who regard honor above any other external advantage, who have any regard for the opinion of good and true men, and who would care to establish a reputation on substantial grounds, avoid the stumbling-block of cheap teeth and advertising. The success attending this line of procedure is of the most ephemeral nature, requiring a constant resort to the same artificial stimulant, while without doubt it ostracises the operator from association and intercourse with such as might be a benefit, and it does not catch those of the public whose patronage and influence are the mainstay of a lucrative practice. It appeals to the most degrading sense of humanity, and leads the ignorant, thoughtless victim to expect good results without adequate remuneration, a principle which the commonest laborer, from the hod-carrier to the longshoreman and washee washee Chinaman, has long since recognized as vicious and wrong. We would perhaps not be interested in this disgraceful, unprofessional, unsound and undignified way of boasting along an unhealthy and undesirable practice, if it were not for the pernicious and totally uncalled-for sacrifice of good teeth which it involves, and the false impressions and wrong views it fastens upon the poor victims, who are led to measure the standard of the profession by their experience with these snappers and whippers-in whose failures and misdeeds are laid up to the general account too frequently.

It may be possible that this idea of demoralizing degeneracy is an outcome of too much competition, of too much supply for the demand for professionals, and the resulting sickly and unsatisfactory growth of practice, but my own opinion is not that such is the case. Since we will always find room at the top for good men, and the demand is always for more of such, and welcome to them with both hands held up.

What the public and professional demand of the day is, for less indiscriminate slaughter of good teeth, and

more conservative treatment and preservation along the lines of advanced ideas and present day possibilities.—*Dominion Dent. Journal.*

ARTICLE IV.

CONSTRUCTING CROWN-AND-BRIDGE-WORK.

BY DR. G. W. MELOTTE, ITHACA, N. Y.

Gold in Holy Writ stands for truth, and of all metals that man has been able to manipulate, I think it stands at the head. Platinum ranks by the side of gold, and in the construction of crown- and bridge-work we have to deal with gold and platinum.

It is curious to note the effect that can be produced by placing a piece of pure gold on a piece of platinum and passing it through the rolls together, first heating them over a Bunsen burner. You find, if the surfaces are clean, there will be perfect welding, as perfect as you can weld two pieces of cohesive gold foil. This form of gold and platinum is used in backing up teeth, using pure gold to bring the tooth that is too white up to a richness in color that will serve the purpose. Another curious fact is, that pure gold under the blow pipe, 18 carat—and I do not know but any carat gold—can be readily welded. The surface must be cleansed by applying borax rubbed on a slate or piece of ground glass. I do not find it necessary in welding gold bands to put them into sulphuric acid, the borax answers every purpose of purifying the surface. To weld a gold band let the edges lap, bringing the edges into perfect co-adaptation, apply the creamy borax to the parts to be united, then with a flowing or soft flame of the blow-pipe bring the gold to a perfect redness when a concentration of the flame will cause a slight fusion of the surfaces and thereby welding.

I learned this method of welding gold from Dr. Bing, of Paris, a year ago last summer. I saw Dr. Bing do the work nicely, and thought it would be a practical thing with me. Finding I could not do it very well at first, I laid it aside until Dr. Templeton visited me last August, and I showed him this method of welding coined gold. He seemed to be very much pleased with it, and was able to do it himself, and that gave me great encouragement, and so from that time to the present I have welded all my bands. I use no solder except soldering on the caps in forming cusps. I do not like to use very much gold in the anterior portion of the mouth. By beating the gold after a band is formed and doubling it over, you can approximate the shape of a cuspid, and it is easy to weld. I have been able in one case to join a piece of gold on by making the upper edges free, then by careful manipulation of the blow-pipe I was able to add one piece after another till I made a cuspid with a thick end or point over the surface. I think this method of uniting bands much better than to use solder. Soldering produces weakness of the band when it unites at a slight heat. If No. 18 carat gold, it lowers the character of the gold in the main at that point. If the band should require stretching, it may be done with a hammer at the point where the surfaces have been united in the weld without reducing the general thickness of the band.

We will now construct the anchorages for a bridge. The case is one involving the loss of the first and second bicuspid, together with the first molar, right side, lower jaw, anteriorly we have a sound cuspid tooth and a firm lateral incisor root; posteriorly the molar is sound, with no antagonizing tooth in the upper jaw. We will prepare the lateral root for a Richmond crown, the construction of which I presume you are all familiar. The cuspid may be banded by excising the crown. A tooth cut off and nerve pulp destroyed, banded and capped in the style of a Richmond crown with porcelain base, gives stronger

anchorage for a base than that of a banded cuspid tooth, or, in fact, any tooth banded. It is true, we have the prejudice of patients to contend with, and possibly our own timidity in cutting of teeth. I am not afraid to cut off sound teeth, and think it would promise greater strength and permanency to do so.

But in this case the sound cuspid has been banded, the lateral root furnished with a Richmond crown, completing the two anterior abutments. We will now prepare the second molar for the posterior anchorage. In this case there is no occluding tooth in the upper jaw. We all know it is important that the bulbous portion of a tooth should be removed and straightened, so that the band when fitted may pass down under the free margin of the gum, and you can crowd it down; you had better have it go beyond the point your judgment would seem to indicate rather than to have it too short. I think it is one of the sources of protecting teeth from decay. We will say, we have taken off the bulbous portion of the tooth. To obtund sensibility, it is well to add alcohol to water; it will also sharpen the corundum, so that it will cut more readily than otherwise, and, of course, you all know a sharp knife is better than a dull one.

Now, we have prepared the tooth with the exception of removing the cusps. In this case I said there was no occluding tooth. It stood alone, without any antagonism, and we are going to benefit the tooth by giving it something to do. In making my bands, I wrap a piece of gold around the tooth, lap it, hold it with the fingers, and mark it. I think most crown workers who do a great deal of bridge-work fall into the habit of doing it in this way without measurements. It is well enough for a man to measure when he first commences,

Now, we have the size, and this (illustrating) will represent the gold band. It have got it lapped at the point you see. If you use solder instead of welding in the commencement, it will perhaps be well enough to take a

little whiting mixed in alcohol and coat the surface, leaving a point just at the top, joining with soldering there. This leaves the bottom of the band open. If you drive it on the tooth there will be less resistance, and you can fit a band to a tooth easier than if you had joined it from the top to the bottom or the whole length. You fill in the end with plaster of Paris mixed with sulphate of potash or salt and water, so that it will set quickly and fit the band in there, tamp it down so the air will bubble out. As soon as it sets carefully remove the band. The portion of the band not occupied by plaster of Paris is filled with fusible metal melting at 150° F. You cut it off with excising forceps and drop it into the band, then with a puff of the blow-pipe melt it. The plaster is now inverted. You have placed your pieces of fusible metal into the band, and, with a puff of the blow-pipe, have melted them. Do not overheat, but barely melt the pieces of metal, and fill it a little more than full. As soon as it is congealed and hard, remove the plaster. You can trim gold down within a line or line and a half above the cusps, and then using 22 carat gold there will be no trouble with the hammer and burnishers to burnish it over into the cusps. You can take an impression in plaster and make a die and counter die with fusible metal melting at 212° .

After you burnish gold down into this fusible metal or cusps you make a die, swage out a piece, then with a small ladle placed in boiling water the metal will melt below the temperature of the water. It is better to do it in that way than to resort to the blow-pipe. I find in using the blow-pipe, that there is great danger of overheating, and the pieces of metal unite with gold and spoil it. Let me say here, by way of caution, if you try this method of fusible metal, and are not careful to remove every particle of it before you put your pieces under the blow-pipe again, you will wish you had never seen Melotte or anybody else. There would be a union of

the fusible metal with the gold, destroying the integrity of the gold. If you are careful in the operation to remove the diffusible metal perfectly, you will have no trouble in soldering on the little cap of gold into the gold band. Now, you have made the crown with the exception of the band, contouring and fitting it to the tooth in the mouth, and you have taken an impression, you have done the whole work of making the crown, getting a crown that will go on and answer the purpose of the posterior abutments nicely.

A Member: Do you band before you put the fusible metal in?

Dr. Melotte: I do not. It would be well to do it, but I have no time, as a rule, to do that. Perhaps it would be well for a man to do it when he first commences to do this kind of work.

A Member: Will you please tell us how you weld it?

Dr. Melotte: "The Lord breathed into man the breath of life." I use some of it in connection with the blow-pipe, and by coating the surface with borax, you are enabled to bring it up to the heat of fusion. The molecules of the upper layer to the lower layer will come in contact with heat and readily unite. If you are not careful, you will spoil your band; so it is well enough to experiment with pieces of gold in soldering before adapting it in actual practice. In doing this work, it is well to have a blacksmith's heat, which is a general heat, heating your band up thoroughly before you concentrate the heat, otherwise it is better, perhaps, to point the flame a bit, heating it up until the material is ready to melt; then you get your welding. You may spoil a number of bands of gold before you are able to do the actual work, but you will be surprised how well you can do it if you learn to emit a nice flame with the blow-pipe.

A Member: Why do you use shellac on porcelain?

Dr. Melotte: Because in burning it carbonates and gives you a layer of charcoal next to the porcelain. It

protects the porcelain more perfectly than it is protected with the ordinary investment of plaster of Paris.

Dr. Harroun: I am in the habit of coating the surface of a tooth, to prevent the plaster of Paris from melting. It forms a coating there, so to speak, prevents the plaster from shrinking down, and forms a roughness on the surface.

Dr. Melotte: That point was suggested to me by a dentist of Utica, in combining the porcelain and gold. He told me that was the course he pursued. I find it a nice thing to do. I am conscious of the fact that with porcelains you cannot be too careful to keep them from contact. Considerable expansion and contraction take place when the molecules are under the excitement of returning to their primitive condition. Of course, there is great danger of breaking. Dr. Starr suggested that pieces of mica be put between the porcelains we use. In olden times it was suggested, that a piece of tissue paper or writing paper put in between would prevent breaking. I think mica is a very good thing, indeed, for this purpose. We should see that the porcelains are not in contact when they are invested.

I have reached a point now where I have constructed my abutments. I call your attention to one of the most important points connected with the work, and yet one that is simple—taking the impression. If this tooth (illustrating) leans toward the anterior teeth, or if there is a wedge-shape or straight space, you may have trouble from breaking of the plaster, making your impression imperfect. To obviate that, I have a piece of modeling compound and press it with my fingers between the teeth. I remove it, put it into cold water, then with a knife I trim on the buccal and lingual surfaces, leaving them a little narrower at the top. Before placing it back, I warm the surface, and direct the patient to bite down on it, leaving an imprint of the occluding teeth. Be careful to see that the patient bites correctly. Now remove the pieces again

and trim, so that the modeling compound will come in contact with the anterior and posterior portions of the band, but not to cover any more than you can help. You have trimmed it and replaced it. It is in position. The patient has bitten down on it. You may let them try it again, if you are certain they will bite in the same place. The imprints of the cusps are there. Now you take an impression in plaster, the modeling compound being in position. You take your plaster, and if the compound remains in the mouth and does not give away with the plaster, remove it and put it in its place. The model drawn on the board is but a rough sketch. It represents the two centrals and a lateral together with a cuspid with its band on. Now, in taking an impression, I find that the imprint of this tooth is in the impression. There are few men who practice making impressions with bands on preparatory to making a restoration or bridge; they take impressions in modeling compound. They may be experts in that particular line, and they may succeed in a small piece of bridge work, and may with their method save time, but I would not attempt to do it. A gentleman said to me a short time ago, "It takes so long to remove a plaster impression from the model," and that is one of the reasons why he does not use it. Then, again, sometimes patients object to certain things you want to do. My patients do not object, because I do just as I have a mind to. As a rule, I do, or else I do not do the work.

I have taken the plaster impression, and am about to pour into it plaster of Paris to make my model on which my bridges are constructed. I take two pins and place them into the impression of two of these teeth a little ways (illustrating) apart. The heads are standing up, and the impression is before you, and you are looking down into the imprints of the teeth. I take the pins, place them in the cutting edge of the teeth in this case, then I take some little bits of fusible metal and cut it off with excising forceps and place them into the imprint of the teeth, and with a puff of the blow-pipe fuse the metal, and jar it down same as with plaster, and then you have got the tips of the teeth like that which you see represented on the board. Dr. Templeton has three or four

combined tips that I removed from a case while he was with me. He will show these tips to you at my clinic this afternoon. I will take an impression of some one's mouth and show you the method of making these tips. You cut off the ends of the pins and leave the dowels around them, leaving the pins one-half or one quarter of an inch in length, then fill up the model with investment material, plaster of Paris and marble dust. One-third marble dust and two-thirds plaster of Paris is about my formula. Your plaster is hard, you cut away and down on to these teeth, cutting away the plaster impression you cut to the tips. Being metal you are in no danger of marring them. I have got to a place now where I find my modeling compound is in the same position with the cusps upward (this being a lower case) that it was when the patient left the imprint. You readily see that. When I have taken an impression of the occluding teeth (and I take it with plaster), I pour in fusible metal quickly. If I do not get a perfect occlusion, I can pour it several times; I get it quicker than it takes the plaster to set.

The advantage in standing before you and speaking to you in this way is, that I am enabled to command the attention of every one of you at the same time, and am able to state points in the construction of this work which would be very difficult for you to see at a clinic, and it would be likewise difficult for me to perform in the time allotted for a single clinic. I could not do it. There is not a bridge worker in existence (if there is one I would like to see him) who has not had more or less failures, and if he has been at work four or five years in this line, and has not had quite a good many failures, then he must be a better man than I am, and such a man is in danger of toppling over. Our successes flatter us; our failures halt us, and make us consider the ground that we have been over, and make us a little more careful in the future.

A Member: Will you tell us how you make a dummy?

Dr. Melotte: I will state first what happened in my office. My assistant was working for an elderly gentlemen, and he got to the point of adding the dummy, and he turned to me and said, "What shall I do with the dummy?" The

man looked up at him with daggers in his eyes, but the young man gave him to understand that he did not mean him.

I do not know how they came to be called dummies, unless they were considered dummies who worked at them first.

I will make the first dummy, and I shall prefer to take an ordinary cuspid tooth, and in grinding it I may find it too long from the pins up to the cutting edge. Dr. Richmond showed me this method of grinding a cuspid tooth to keep the proportions perfect—that is, to grind from the lingual toward the labial surface, as perhaps you are able to see this tooth (illustrating). You take a tooth that is blunt on the end, the advantage is that you smoke it upon the porcelain, so that when you add gold you have a better looking tooth than you would otherwise have; then, besides, you first put a piece of backing on, and this backing and the tooth are ground on the surface, the backing being beveled with the porcelain. You take a piece of thick gold, and where you want great strength on the cutting edge and desire to prevent the teeth from breaking, I should use gold that has about five per cent. of platinum, using No. 23 or 24 and let it extend about a line above the cutting edge, wax it on when it will be ready for investment. You take a die and swage out a bicuspid, take one of the bicuspid dies, swage out a piece of gold, place it on, bevel toward the outer cusp, so that it will fit on to the tooth in the manner in which I hold this (illustrating), wax it in place and invest it, varnishing it at first. Invest in plaster of Paris, marble dust and sand, then after the investment has set, dry it out, melt out your wax, add your gold carefully, you may put in tips of gold coin or filings, fill it up with filings and solder, and in that way you have got your dummy made for your first bicuspid. Proceed with the next and with the molar in a similar manner, and you have your dummies, which, of course, you have tried on and arranged with a view to the occluding teeth. Of course, this work needs care and time, and I cannot find language to describe to you definitely just how to proceed. There is an important point I want to make, and that is that each one of the dummies should be ground, the porcelain and the gold, so that they will touch the ridge, and especially in those cases where there

are any bridges which fail to have touched, because the tissues will kindly form around the points of contact, and you need not be much afraid of inflammation, and if you get a little hypertrophy you can allay it as well with a saturated solution of salicylic acid as anything, and after a little the gum will kindly form and it comes up around rather than shrinks away from the dummy.—*Ohio Dental Journal*.

ARTICLE V.

COMBINATION FILLINGS.

The subject of combination fillings is one of great interest to me, and in looking over my records I find that the percentage of these in proportion to the whole number of fillings that I put in is very great. I believe that not one in ten realizes the practical utility of such fillings in the saving of teeth, and I doubt very much if one in twenty uses them to any great extent.

If the teeth are young or old, and of poor quality, to my mind it is much better to put in a combination filling of cement and gold than to fill entirely with gold. Of course, we have all been in the habit of lining up cavities with cements and filling them with gold afterwards. This is a practical and valuable method, and the principle may be extended very materially.

I have been in the habit for some time of putting cement into cavities, and, while the cement is soft, placing plastic gold right into it. By so doing, the gold of itself obtains the necessary retaining points; whereas, if you put the cement in and allow it to harden, then you must re-excavate and form undercuts to hold the gold. In crown cavities, for example, when the central portion of the tooth is largely decayed, but the overlapping enamel is still sufficiently strong to withstand the force of mastication, either

amalgam or gold can be put in, and the surplus cement which is squeezed out by forcing the gold or amalgam into the cavity cut away. After waiting a minute or two for the cement to harden, the filling can be furnished with gold or amalgam, as the case may be. It seems to me that in many cases these fillings are better than if they were made of one material. We find oftentimes in connection with a large cavity on the mesial surface of a molar, a small pin-head cavity in the distal surface of the adjoining bicuspid. My experience is, that if I fill these smaller cavities with gold, decay will reappear, and the fillings tumble out.

In such cases I often use tin and gold, a combination which you have heard advocated by Dr. Hamilton and Dr. Briggs, and which was spoken of many years ago in an article by Dr. Abbott, of Berlin. It is very servicable in the crown cavities, of sixth-year molars, also in buccal cavities, and in the temporary teeth. The statement which has been made here by Dr. Hamilton and others, that these fillings after a time become hard, something like an amalgam filling, is a fact which I have demonstrated many times in my own practice. One advantage of the combination of tin and gold is that it does not discolor the teeth, as amalgam. As to the use of amalgam and gold, I know that my combination of these materials lasts longer than the all-gold filling which I formerly inserted in similar cases. Oftentimes, in talking with dentists, I ask them if they use this combination, and they will say "yes", and then remark, "Do you use a matrix?" Thus showing that they have no idea of the proper manner of putting in such filling, and consequently, no idea of their value in saving teeth. To correct such false ideas is the reason for my appearing before you to-night.

The use of cement and gold in the front teeth, to me, a very important affair. Without first putting cement in the case of large cavities, or moderate cavities in the poorer quality of teeth, I

chances for permanent success are small. Cavities in frail teeth, where it is difficult to obtain a good retaining shape, can be filled with gold and cement, and the cement will assist very materially in retaining the filling.

In large cavities, if we can have a considerable proportion of the filling cement, we have a better filling, as there is less metal, and the cement will adapt itself better to the tooth than any other material. Here are specimens showing the method of putting in these fillings. This one shows a large approximal cavity in a molar. If a matrix is adjusted and cement placed in the cavity, and, while it is soft amalgam inserted, the cement will be crowded down next to the matrix, and, consequently, the edges of the cavity will not be completely protected by a metal. To overcome this, I put in the cement before putting on the matrix; then add a little amalgam, thoroughly incorporating it with the cement; then trim off around the cavity so that the edge towards the matrix is entirely exposed; then put on the matrix, and finish with amalgam or gold. In other cases I find it convenient to put on the matrix, and put a little amalgam next to it; then fill the body of the cavity with cement and finish with amalgam or gold, or both, as the case may be. The large filling in the lateral incisor, which has been passed around for your inspection, and which, you will remember, is quite large,—restoring the contour of the distal portion of the tooth,—was made in the following manner: The cavity was prepared so that there was considerable undercut at the cervical wall; there was a slight undercut towards the point. Cement was first put in; then plastic gold crowded into the cement; *but the gold did not go into any retaining point whatever*. After waiting a few minutes for the cement to become hard, the filling was finished with odd lots of gold that I picked up around the office, and with an extra hard blow of the automatic mallet. My idea was to see if the blow from the automatic would break up the cement and prevent its being strong. Now, I want this filling.

tested.* I may suffer a great disappointment to-night, because I don't know how strong the filling is, and it is possible that the gold may have no retention at all in the cement; but I do know that the mallet was put on very much harder than it would have been if the filling had been in the mouth, and the filling was very thoroughly finished with burnishes, plate-files, disks, and stones.

After seeing the pressure it required to break out this filling, I think I should dare trust it in the mouth. Of course, in filling these cavities, you are laboring under unfavorable conditions.—CLAPP, in *Odontographic Journal*.

Editorial, Etc.

BALTIMORE DENTISTS IN GERMANY.—Despite the well-known fact that Germany annually sends her contingent of students to America to study dentistry at the world-renowned dental colleges of Baltimore, whose graduates are found in large numbers in the official dental directory of Germany, a campaign has for some time been carried on, particularly by the police of Berlin, against the so-called "wild American doctors" with trans-Atlantic diplomas. This has led to many curious results.

Quite a number of persons, who on their shingles announced themselves as American doctors and dentists, or "dentists approved in Baltimore," have been sentenced to fines of various amounts, some as high as 300 marks. The question of their right to such titles has been closely inquired into. Through the foreign department the police have in many cases found out that the diplomas were not acquired *rite*, that is, after a proper course of studying in an American college.

Besides the well-known Baltimore institutions to which a particular importance has been attached for long years because of the superior efficiency of its graduates practicing in the

*The tooth was then given the President, who removed the filling with strong excavators, and stated that, in his opinion, it was more firmly held in place than would have been possible in such a cavity without the use of cement.

Fatherland, the following schools are known to be legally entitled to confer the degree, and acknowledged as such, namely, the University of Michigan, the University of Wisconsin, the Cental College of Delaware, the Collegium Dentale Philadelphiae in Republica Pennsylvaniae, the New York College of Dentistry, the Collegium Columbianum and the Collegium Medicorum Chirurgorum Novi Eboraci, (New York.)

On the other hand it is alleged that other "colleges", of which numerous diplomas are afloat, never existed. Thus persons of both sexes who, after a regular course of study at an officially authorized American institution, have received then and there the degree of doctor of dental surgery, doctor of dentistry, etc., are permitted to advertise themselves as "doctor of dental surgery, etc., of such and such university or college;" but they are not allowed to call themselves American dentist, or "doctor of dentistry approved in America," or "not approved in Germany," because the police authorities interpret this as tantamount to "assuming a medical or dental title," and the courts have in many cases taken the like view. The Baltimore colleges are really the most thorough dental colleges in the United States, and it is not surprising that the Germans should be getting more particular in this matter.—GOSSIP FROM ABROAD.—*The Baltimore Sun*.

NATIONAL ASSOCIATION OF DENTAL EXAMINERS.

The eleventh annual meeting of the National Association of Dental Examiners was held at Niagara Falls, commencing Monday, August 1, 1892.

The sessions were presided over by the vice-president, Dr. Magill, the elected president, Dr. L. D. Shepard, of Boston, explaining his resignation from the State Board of Massachusetts, which necessarily carried with it his resignation of the presidency of the association. The resignation was accepted with regret, and Dr. Shepard was unanimously accorded the privileges of the floor.

The following State boards were represented at the sessions :

Colorado.—George J. Hartung.

Georgia.—D. D. Atkinson.

Iowa.—J. T. Abbott, J. B. Monfort.

Indiana.—S. T. Kirk.

Maryland.—T. S. Waters.

Minnesota.—L. W. Lyon.

Massachusetts.—E. V. McLeod.

New Jersey.—Fred. A. Levy.

Ohio.—Grant Mollyneaux, Grant Mitchell.

Pennsylvania.—W. E. Magill, Louis Jack, J. A. Libbey.

Tennessee.—J. Y. Crawford.

Wisconsin.—Edgar Palmer.

Kansas.—A. H. Thompson.

The following boards were admitted to membership :

Virginia.—J. Hall Moore.

North Carolina.—V. E. Turner.

Oklahoma.—D. A. Peoples.

South Dakota.—C. W. Sturtevant.

District of Columbia.—Williams Donnally.

At the instance of the committee on colleges, the following communication was sent to the National Association of Dental Faculties :

NIAGARA FALLS, Aug. 1, 1892.

To the National Association of Dental Faculties :

GENTLEMEN,—Whereas, a very considerable abuse has arisen by the improper use by students of the various certificates of the schools, such as the "standing" and "passing" certificates, to support students and graduates under age in their attempt to illegally engage in practice; we therefore ask your association to request the various colleges to have their "standing" and "passing" certificates of such uniformity of terms in each case that they can be used for no other purpose, and that they be printed in few words and small type, and be signed only by the dean,

Respectfully,

NATIONAL ASSOCIATION OF DENTAL EXAMINERS,

FRED. A. LEVY, *Secretary*.

A committee of conference was appointed, consisting of Drs Truman, Marshall and Swain, on the part of the Facul-

ties Association, and Donnally, Palmer and Monfort, on the part of the Examiners Association, which after consultation agreed upon a favorable report.

Dr. Lyon offered the resignation of the Minnesota board, which was laid upon the table, as it had evidently been offered as the result of a misunderstanding, and the board was requested to withdraw it.

The following resolution, offered by *Dr. Crawford, was adopted.

Resolved, That when a member of any State board becomes a teacher of a dental school, his resignation from his board should follow.

A resolution protesting against the classification of dentists as manufacturers and the collection of census statistics from them under the provisions of House Bill No. 7696, commonly known as the Wilcox bill, was adopted. The resolution was similar in terms to those adopted by other dental societies.

The committee on colleges reported that they had received reports showing that the actual number of students in attendance at the last sessions in the schools recognized by the Examiners Association was 2881; of graduates, 1357. In the schools not recognized by the association the students were 236; graduates, 96.

The report also considered desirable advances to be made in educational methods, and offered the following memorial, which the secretary was directed to transmit to the National Association of Dental Faculties :

The National Association of Dental Examiners would respectfully memorialize the National Association of Dental Faculties to authorize two advances in the system of dental education.

These are : First, that your association require the universal enforcement of a higher grade of preliminary education of candidates for matriculation. This proposition lies at the foundation of dental education, in which is involved the quality of the graduates of the future, upon which de-

pend the advancement, the standing, and the dignity of the dental profession.

The second proposition is that complete preparation be made in each school for laboratory technique in the studies of histology, pathology, and in each of the departments of dental surgery and dental prosthesis, and that this method of teaching be made a requirement of the schools.

The committee also reported the following amended list of colleges which they recommend as reputable :

Baltimore College of Dental Surgery, Baltimore, Md.

Boston Dental College, Boston, Mass.

Chicago College of Dental Surgery, Chicago, Ill.

College of Dentistry, Department of Medicine, University of Minnesota, Minneapolis, Minn. .

Dental Department, Columbian University, Washington, D. C.

Dental Department, National University, Washington, D. C.

Northwestern University Dental School, (Formerly Dental Department of Northwestern University, University Dental College.)

Dental Department of Southern Medical College, Atlanta, Ga.

Dental Department of University of Tennessee, Nashville, Tenn

Harvard University, Dental Department, Cambridge, Mass.

Indiana Dental College, Indianapolis, Ind.

Kansas City Dental College, Kansas City, Mo.

Louisville College of Dentistry, Louisville, Ky.

Missouri Dental College, St. Louis, Mo.

New York College of Dentistry, New York City.

Northwestern College of Dental Surgery, Chicago, Ill.

Ohio College of Dental Surgery, Cincinnati, O.

Pennsylvania College of Dental Surgery, Philadelphia, Pa.

Philadelphia Dental College, Philadelphia, Pa.

School of Dentistry of Meharry Medical Department of Central Tennessee College, Nashville, Tenn.

University of California, Dental Department, San Francisco, Cal.

University of Iowa, Dental Department, Iowa City, Ia.

University of Maryland, Dental Department, Baltimore,
Md.

University of Michigan, Dental Department, Ann Arbor,
Mich.

University of Pennsylvania, Dental Department, Philadelphia, Pa.

Vanderbilt University, Dental Department, Nashville,
Tenn.

Western Dental College, Kansas City, Mo.

Minnesota Hospital College, Dental Department, Minneapolis, Minn. (defunct).

St. Paul Medical College, Dental Department, St. Paul,
Minn. (defunct.)

American College of Dental Surgery, Chicago, Ill.

The report was adopted.

The following officers were elected for the ensuing year :
W. E. Magill, Erie, Pa., president; J. Y. Crawford, Nashville,
Tenn., vice-president; Fred. A. Levy, Orange, N. J., secretary and treasurer.

Adjourned.

Monthly Summary.

COMPOUND FILLINGS.—One of the greatest economies in operative dentistry, and the best class of fillings for large cavities, are compound fillings of alloy or oxyphosphate as the main filling, with gold as a cap; or oxyphosphate as a filling and alloy as a cap. These are not only more economical than all gold, but better. An all gold filling can not be put in as perfectly as alloy or oxyphosphate, and yet, when capped with gold, the filling is as presentable as all gold. The advantage of filling a large cavity with oxyphosphate and capping with alloy is, that if the oxyphosphate is used soft and is of good quality, it adheres to the walls of the cavity, and is, therefore, impervious, while the alloy is more enduring as a surface.

All these fillings may be allowed first to harden, and then a portion cut out for capping, or the capping may be incorporated with the filling while soft. If the latter, only a small portion of the capping material is pressed into the filling while soft, and then, as the filling sets, more is added, first next to the walls, and gradually extended to the center, and then sufficient is added to complete the filling. Or a thin plate of gold can be fitted to the shape of the cavity, and, after two or three short pins are soldered to the under side, it is pressed on to the soft filling. If you are not sure of its articulation with other teeth, first fill the cavity with wax, and try it on; if on the grinding surface, the plate should conform to the contour of the tooth.

Also, after a root has been properly prepared, a gold ferule of thin gold plate may be made, and this capped with a plate of the same material for a grinding surface. Then fill both the skeleton tooth and the root with oxyphosphate and place in position. It makes a durable artificial tooth.—*Items of Interest.*

AMALGAMS.—That there is a great difference in amalgams for filling teeth is generally conceded. A recent writer treating on amalgams says: "Brittleness being one of the weaknesses of amalgams, every possible precaution should be taken to prevent thin and sharp edges." One would suppose this writer had gone back to the time when a committee reported to the New Jersey Society, "That after examining among a large number of specimens on the market we find little difference in them. They are all coarse in texture, rough in surface and brittle in substance. They shrink in hardening, blacken in use and are unreliable in duration."

Now, we thought to ourself, if this is so, I will see what time and patience and skill can do to improve it. For two years we worked at it, till we found that by using a proper proportion of gold, platina, silver and tin, these defects were overcome. We gave out samples during the second year to the best and most thoughtful dentists of the State, and at the end of that year we had the pleasure of having that same association pass a resolution of commendation. There are few who do not know of its success.—*Items of Interest.*

I think we cannot be too careful in avoiding lengthy and painful operations for children. I rarely introduce gold fillings, and never very large ones, into the teeth of young children. I refer to the permanent teeth, of course; yet I have seen many temporary teeth filled with gold. Sixth-year molars are sometimes filled with gold soon after eruption, but in such cases they are liable to give out in a short time. A lady in my office, one day, for whose child I was then operating, said to me that the child's eldest sister had previously quite a number of teeth filled by an excellent dentist. He did some very heroic work for her, and was anxious to have all the work done in a very limited time. After the operation was over, the child had St. Vitus dance, and was for a long time in a very nervous condition. — FRANCIS C. E.)

COMBINATION OF CEMENT WITH AMALGAM.—Mix the Amalgam in the usual manner, avoiding an excess of mercury, whereas the cement is mixed perhaps slightly thinner than usual; the two are then thoroughly incorporated by means of a stiff spatula. The amount of amalgam used is, in bulk, about one-third to one-half that of the cement. The material may also be prepared by simply dropping the amalgam already mixed into the liquid of the phosphate cement, and then incorporating enough powder to make a stiff paste. The filling is inserted in the same manner as a simple cement filling.—*Cosmos*.

TO CLARIFY WAX.—Melt in hot-water bath; then remove from water bath and bring to a slow boil on the stove. Into the boiling wax break a fresh egg, and stir three or four minutes till the egg is thoroughly cooked. Strain through a piece of cheese cloth, to remove all pieces of egg, and you will have your wax as clean and pure as when brought from the dental depot.—*Items of Interest*.

PLASTER OF PARIS FORMULA.—I. To Make Plaster set Hard—Mix best plaster of Paris with about 10 per cent. (more or less, according to effect ascertained by preliminary experiment) of very finely powdered marble (calcium carbonate). Or add to it about 6 per cent. of powdered alum, or about the same amount of ammonium chloride, before mixing with water.

2. To Make Plaster Set Slower—Mix it with 2 to 4 per cent. of powdered *altæa* root before adding the water. This not only retards the hardening of the plaster, but also enables it to be cut, filed, sawed and turned.

An addition of 8 per cent. of *althæa*, powder retards the complete setting of the plaster for about one hour, so that the mass can be used for any purpose where it is to remain plastic at least during a portion of that time.—*Amer. Drug.*

As an illustration of how happily things dovetail and fit into one another in this world, vegetarianism comes along as a new fashion, just as Sir James Crichton-Browne, who is out on a physiological hunting expedition, has made the wonderful discovery that we are to lose our positions as carnivora. At the present rates of estimate the time is calculable when we will have no teeth. Out of 1,861 children under twelve years that passed under his critical inspection, only 104 had normal teeth, needing neither filling nor extracting. Various temporizing expedients are suggested, such as school inspection of teeth, for which there will doubtless be a municipal dentist. The outlook is surely awfully awful, excepting to those registered as "mechanical" dentists.

Dr. G. T. Phillips, of Rutland, Vt., says common stove blacking, of the consistence of cream, covering the packing of Whitney vulcanizers, makes the joint very tight. Our own experiences has showed this to be good, and there are probably many with whom this will not be new. Some, however, will be thankful for the information.

For years I have not filled the permanent teeth with gold, and it is the one thing that we should impress upon our patients, especially the parents. They say, "Are not these the permanent teeth?" Yes, but gold is not the thing to fill them with. All of the teeth of my patients who have been treated in this manner are better preserved. We all know how much more exhausting it is to fill teeth for children than for adults.—STOCTON (C. E.), *International Dental Journal*.

A NICKEL REMOVING SOLUTION.—In order to remove a coating of nickel which does not adhere well M. P. Dronier, in *La Metallurgie*, recommends that the article should be plunged in an oxidizing liquid composed of bichromate of potash, sulphuric acid and water in the proportions ordinarily used for batteries. The article should then be taken out more or less quickly according to the thickness of the deposit and washed and, if necessary, repolished.—*Eng. and Min. Jour.*

THERE are all manner of excuses made for the use of tobacco. We now hear it said that its use as a "chaw" keeps the teeth clean. We have been a dentist a good many years, and never saw a clean-mouthed tobacco chewer, though we have seen the mouths of many who did not use it beautifully clean. It is true, as a mopp it does, after a manner, clean the outer surfaces of the teeth, but it leaves the internal surfaces so nasty and full of the stinking stuff, they had much better have used a piece of their wife's mop-rag.

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ARTICLE I.

PROCEEDINGS OF THE NORTH CAROLINA
DENTAL SOCIETY, WINSTON, N. C.,
MAY 24-26, 1892.

AFTERNOON SESSION, MAY 24.

The Minutes of last meeting read and approved.

The essay of Dr. J. H. Durham, of Washington, on "The North Carolina State Dental Society," was received with hearty applause.

Dr. H. C. Herring, of Concord, introduced Dr. M. H. Cryer, of Philadelphia, who spoke as follows:

"Mr. President and members of the North Carolina Dental Association: I feel proud in being invited by your President to meet you here. From what I see we shall have, I think, a very pleasant time, and it will be entertaining and instructive to all of us. It gives me great pleasure to meet one member of my old graduating class of 1876; it is the first that I have seen of him since that time, and I was glad to have him tap me on the shoulder and say, 'Hello, Matt, how are you?' There are also

several members here whom I have met before in Philadelphia, and it gives me great pleasure to meet them again.

I have been invited to perform any surgical operation that might be presented, and I only hope that we may have a number of cases which will be of interest to this Association. I have seen two patients, one of whom has had a cancer removed from the left side of his nose. He is an elderly person and from the character of the surrounding tissue I am unwilling to perform a plastic operation as I was in hopes of doing; I fear it might leave the man in a worse condition than he is. The only thing remaining to be done, then, is to perform a purely mechanical operation by covering the opening made by the removal of the cancer with a piece of celluloid or Vulcanite and have it painted the color of the face; this, I think, can be held in position and will make the patient presentable. An oculist is now at work adjusting a pair of spectacle frames and after they are ready we will commence with a wax model, to cover or fill in this opening as near as it can be made to the other side of the nose. After that it will be transferred to vulcanite. There is another case, of which I only had a glance, and that was a cleft palate. As far as I can see, it will be a case for "mechanical work."

Moved and seconded that the visiting dentists be accorded the privileges of the floor.

Committee on Dental Education and Literature responded with two papers, one by Dr. J. H. Loudan and another by Dr. I. N. Carr.

Dr. Durham said: I wish to express my hearty approval of the papers of both Dr. Loudan and Dr. Carr. I think Dr. Loudan has made some very valuable practical suggestions, and I think Dr. Carr's paper is as good a paper upon that subject as I ever heard. Dental education is really the life blood of our society and of dentistry, and that is the only way you can elevate the profession morally and intellectually.

Dr. Morgan, of Nashville, Tenn., said: I wish to

commend the gentlemen for the bold manner in which they speak their sentiments and belief; the young man who read the last paper (Dr. Loudan) deserves particular credit. In the first paper I was very glad to hear the gentleman qualify what Dr. Wood had said with reference to medical schools. I understood him to say it applied to the medical colleges. I differ, however, with the gentleman and with Dr. Wood; I think Dr. Wood's language is entirely too strong and is an insult to his diploma. If the gentleman who read the paper believes that the schools in this country are not endeavoring to do their duty as much as the North Carolina Dental Association and the North Carolina Dental Board, I think he is mistaken in that. Dental education is a subject that will agitate the minds of the profession as long as we claim to be a profession. There are dentists to be educated, and the demands of the dentists how best to educate them will be an unsolved problem at the end of time. I notice both gentlemen commended very highly the plan of pupilage previous to the entrance into college. I believe the experience of college men will bear me out in the assertion that unless you place your pupils in the office of such men as Griffith and Hunter and Turner, or other men of that character, their office pupilage will be a detriment to them instead of an advantage. The experience of college men on this subject has been that those men who have earned their way through college, who came there with an earnest desire to acquire a knowledge of dentistry, that they may be able to place themselves alongside of the professional men of their State, with a just conception of what the word "professional" means, are the students who do best whether they come from a dental office or from behind plow handles, and my observation has been that these are best and not those who come from an office, as a rule. The pupil from the average office has as much to unlearn as he has to learn, and it takes just about as long to unlearn it and be set right after he comes to college as it does to learn it properly in the first instance.

Dr. B. Holly Smith, of Baltimore, said: The subject of dental education has grown to be an amusing one to me. It seems to be a popular plan in our dental societies to invite an essayist to deliver an oration upon the weakness and faults of dental schools and then to give the teacher an opportunity to reply and exonerate the institution. I do not stand here in defence of the dental college. I commend the sentiments of the paper which the first essayist read in regard to the cultivation of character and the hints and suggestions to young men, but I must take on a slight exception to it, and repeat the statement which I made before in regard to the forcing of colleges to extend the course. So far as the extension of the course is concerned, it has been more the result of a recognition on the part of the faculties of the various colleges than sentiment in the profession. Without any demand on the part of associations, colleges are eager and anxious to take such steps as would answer that demand, so it is not a matter between colleges and the profession. Gentlemen, we are all graduates, or ought to be, of some dental college and we remember with pleasure the first early trainings in our Alma Mater; let us not go away from them; it would be a sad day if we were to begin to complain of their educational influences. What we want to do is to uphold the work and encourage rather than to find fault.

I was particularly pleased with the second essayist's paper. It is a source of considerable gratification to see a young man who worked with me and under me, come forward with so many valuable suggestions. As for your dental societies it strikes me that in this line of dental education there can be more done by encouraging a man. After we give you men from a dental college, we have done what we could; then let him go to work if it be nothing more than to make a scrap book, but as for giving him professional standing we cannot do that.

In regard to the comparison which was made between

European and American education, right along that line I saw a little discussion between Pres. Elliott and a member of the New York School Board in regard to the comparison between education in Europe and America. There always will be a difference of opinion as to the merits and demerits in comparing one system with another. So far as my experience goes I will say, not because I want to boast of our institutions, that there can be no doubt of the supremacy of the teachings and of the results in American schools of dentistry. I believe that in medicine we do not see the results quite, that they do in Europe. The German experimentors have developed and brought forward instruments that our American students have been slow to learn the use of even, but I do not think that is the way in dentistry so far as I am able to judge. In regard to the subject of dental education, I would reiterate let us try so far as is practicable to encourage the schools to do what they would like to do—they would like to do all that is possible on the line of dental education. Let us have unanimity and uniformity in any demands. Don't demand here in North Carolina that they shall attend three or four years and then go down to Texas and say it is an outrage, and that the colleges are trying to get more money out of the pupils by one more year. Let us have uniformity of sentiment, and if there is any difference let us come together and compare notes, and through our National Association let us harmonize any conflicting elements.

Dr. Carr: I hardly feel capable of replying to the gentleman that has just discussed some of the statements that I made in the paper that I read before you. I would like to say in the outset that it was far from my intention to say anything derogatory to any college in the United States of a reputable character. So far as the college of Nashville, Tenn., is concerned, which our good brother represents, we all know that there is none better. I quoted Prof. H. C. Wood—quoted his language, I think, verbatim—and it was not that I think colleges are not necessary to

educate the young men. But my idea was that young men that are taken into college without any preliminary education will certainly require a longer term of study to acquire the necessary knowledge to practice dentistry successfully, when on the contrary, after he takes a year or two of pupilage under some reputable dentist, I think he is better prepared to enter college and will be a great deal more credit to the profession than if he started into college at the first. None know better than myself how much good work these grand institutions of ours have done, and I am proud of it. There is nothing that I would not be perfectly willing to do to help them on in their grand undertaking to educate the young men of this country in dentistry, and I hope the gentleman will not think that my paper was intended in any particular as the slightest reflection upon any of the colleges of this country.

Dr. C. A. Rominger: I want to say that that is the bed rock upon which we ought to build—this subject of dental education—and doubtless all of us here feel the necessity of early education, and many of us have gone to work when we were unequipped, and now as true dentists, and desirous of elevating the profession and holding out before the youth of this country any ideal course, I say, with that idea before us, we ought to lay broad our foundation. We ought to have our idea clear cut that you may offer the very best advantages to those who seek to enter our profession, that we may seek to elevate not only the mechanical work of the profession but the standing of our profession in the estimation of the public of our State. I feel proud when I look around upon the members of our profession, because of the scope of their information, because of the skill with which they execute their work. Those of us who were at the clinics feel proud of the hands and skill of those who operate at the chairs here in our association; but when we go back to our homes in the months and years to follow, we hear much that comes into our offices from those men who do not come to our

Associations. A number of men are practicing dentistry over the land who would not come to our meetings. They shut themselves off from all improvement, and there are some young men coming into the profession just that way and shutting themselves off from the facilities which we would extend to them if they would allow us. So I say we want to lay a broad foundation and hold out an inviting hand to these and say "come in and learn; be benefactors to the human race, and not those who simply are seeking to use the very best means they can get for their own selfish purposes." We know too well how much the public is damaged in that way.

Another thing: There ought to be no conflict between our societies and our colleges; we are all laboring for the same great end. We ask all the dentists of North Carolina to come here and help us and be helped; and the colleges say to the young men, "come here and take our course; we offer you the best instruction that can be given in this land." And so we ought to lay broad the foundation and encourage the young men who are coming into the profession, so that they may reflect honor upon the profession and that they may be an honor to themselves and a blessing to many. We do not demand sufficient literary education at times, and men are brought into the profession with such a meagre education in literature, that when they come to discuss the questions of the day, their opportunities have been so limited that they are incompetent and do not elevate the profession as they should. Well has Gray said:

"Full many a flower is born to blush unseen,
And waste its sweetness on the desert air."

Young men of great powers of intellect, but whose powers are lying dormant, never having been developed and brought out and polished and made fit to adorn him as the jewel does the beautiful maiden, so when they come to you and ask what are the requirements of a dental education, urge them to go to school that they may fit

themselves and bring out these latent powers and be really useful men, men to be felt, men to execute well the work of the profession which they chose. Let us encourage this subject of dental education and make it broad and help to elevate the standard and give high aspirations and give them the benefit of the instructions and experience which we have gained and that many of us have gotten under great difficulties through long years of toil and struggle.

Dr. Holliday, of Atlanta, said: The medical schools are taking steps demanding three years, and it shows they are not what they should be, or this would not be agitated by them. You can scarcely take up a medical journal that you do not see something about medical education. The second essayist made a point that I commend, and that is writing for the journals. How many of the profession in the South write for the journals every year? You come to these meetings; there may probably be half a dozen essays read, when there should be three times as many. That is because the members are inactive and do not take it upon themselves to write. I am engaged, as some of you know, in the publication of a journal; we need matter to publish sometimes and it is hard to get it. I write to gentlemen, and they say, "well, I will give you something sometimes," but it does not come. This thing of having meetings in sections is quite good.

Dr. G. W. Whitsett: I suppose I will stand all alone in my position, but it does seem to me like this three or four year's business is a piece of the biggest bosh. It is offering an insult to every young man that goes to college to say he has to go so many years until he can get a diploma. I think the colleges ought to raise their standards and say, "If you can get up to this in one year, you can have your diploma. If it takes you a dozen years, it will be so long before you get it." Don't let the Association say, "we will send young men to college and they must stay there three years;" and what is he doing there? He is trying to get the first rudiments of an

education, while he might stay at home and get the same knowledge at one-third cost. I would like to see this society put itself on record as against that iron-clad rule that says a man has to go three years. I want to see the standard of education raised; have the colleges raise it, and then, if you can, go there and complete the course as soon as possible. You can go down to Chapel Hill and if you have only been there one year you can get a diploma, if you have completed the course.

Dr. S. P. Hilliard: I have a son that I am going to start out along that line, two years of office pupilage and then three years at college; that is worth a great deal.

Dr. G. W. Whitsett: But how many boys can you pick up in North Carolina that can give five years before they go to work?

Dr. Hilliard: They must have a good preliminary education.

Dr. Cryer: Dental education, of course has interested me very much. I am one of those unfortunates who did not receive the kind of education that our friend says we ought to have. I went from the plow handle out in Ohio; started the course at 34 years of age, and feel now that if I had had a college education, it would have been of very great benefit to me. I always deplore the lack of it. Dr. Morgan remarked that many of our best men came from the plow handle and not from the office. I believe that I have observed the same thing in the college that I am connected with. Dental education from my standpoint would commence by learning thoroughly the anatomy of the body with which you have to work. You cannot study anatomy except with the scalpel and cadaver. Take Leidy who, when a boy and before he went to college, studies anatomy by dissecting small animals, an example which it would be to the advantage of any intending student to follow. When a dental student cannot get the requisite knowledge from lectures given in his college, the hospitals and dissecting rooms of the medical schools are

open to him at a slight cost. There are also surgical and other operations in the mouth going on, that every dentist ought to understand and be familiar with, and the student has opportunities of seeing these performed without extra charge. Physiology can only be studied properly under experienced teachers, and with modern appliances. It is a pleasure now to be able to state that almost all dental colleges have dissecting rooms, physiological and chemical laboratories and a septic rooms where the gravest surgical operations can be performed and their treatment studied.

I went to a dental college knowing nothing of anatomy or dentistry; whatever knowledge I gained was obtained within the college. At that time, 1874-76, we had what was known as five year men, men who had practiced five years or more. They were allowed to graduate in one year. For some reason I am almost sorry we have not this class now, for I believe those five year men rendered valuable assistance to the young men by showing them how to put in practice the theories of the professors of mechanical and operative dentistry.

In this and other States I find that before a man can practice dentistry, legally, no matter where he has graduated, he has to come before your Dental Board of Examiners. I know one of the examiners in your State personally, and I know, too, that he has the ability to examine in his branch.

Now, if colleges turn out incompetent men, as no doubt they sometimes do, you have a custom-house officer, as it were, here, to say to the incompetent man, "you cannot practice in this State until you have better knowledge of your profession." This will tend to make colleges more careful of whom they send out to practice dentistry, and certainly the student will be spurred to greater diligence in his studies, looking forward to the fact that, even after obtaining his diploma, the aforesaid custom-house officer may debar him from practicing should he not be able to come up to the standard set down by the Board of Examiners of the State in which he desires to practice.

Dr. S. P. Hilliard: I want to make an explanation. I only meant to recommend what I said before; if a man go there and get through in a year, I would not prevent that.

Dr. J. S. Thompson, of Georgia, said: I have been waiting to hear what was said pro and con on this subject, and thought probably I might be needed in defending dental schools, but I think we are pretty much all on the same line. I do not think you have abused dental colleges. You must admit that they are making progress and doing all in their power to elevate the profession, but the profession should not expect too much from the dental school. A certain amount of preparation is necessary before entering a dental college, because there it would be impossible to give them a literary education. We received a communication a short time ago from one of the Boards—a resolution of the Board condemning colleges for passing young men that could not write sufficiently well for them to read their examination papers. Well, you must not expect dental colleges to teach young men how to write. You agree that there has been progress made in the education of the young men. The profession must do their full duty in the matter and look after them when they have graduated, and give them that assistance and maintenance which is necessary to develop the very best professional men. I congratulate these young men upon their papers, which were so well prepared. I enjoyed them very much.

On the subject of Dental Pathology and Therapeutics, Dr. Reminger read a paper prepared by Dr. W. W. Rowe. In the discussion that followed, Dr. F. S. Harris said:

I should think that we might include in immediate root filling those cases where we expose the nerve in the operation. We are agreed that if there is any case which demands immediate root filling, it is a case when there is recent exposure, and then I, for one, am in favor of immediate root filling.

Dr. G. B. Patterson: I cannot agree as to the six weeks' treatment. I have treated many a tooth, but I have yet to treat one over two weeks, and I have been pretty successful. I find if two weeks won't do it, the forceps will. I do not believe in wearing anybody's patience out in treating six and eight weeks. I have had a few patients in my office that say they have had teeth treated for six and eight months and then they would have to have them out.

Dr. J. E. Wyche: I do not think the essayist said anything about immediate root filling after a fistulous opening; with reference to the calculus being on the roots. I had a case some time ago that I would like to hear discussed. It was an upper molar, and on all three of the roots the tartar had gone almost to the apex. I want to know if anybody has had a case, and after getting the tartar off has put it back. I did not attempt it myself; I took the tooth out.

Dr. R. H. Jones: One thing connected with that subject in regard to pivoting teeth. I would like to ask if the gentlemen do not sometimes pivot teeth which have blind abscesses.

On the subject of Histology and Microscopy the chairman pleaded incompetency.

Dr. J. H. Durham: They say an honest confession is good for the soul, and I do plead incompetency to get up a paper on that subject that would interest men like these.

Dr. F. S. Harris: I was a party to putting up a job, so to speak, on our chairman. I wrote around to the members of the committee, and said, "let's be complimentary to our chairman and ask him to prepare that paper."

President C. L. Alexander: It seems to me, you, gentlemen, have acted wisely. (Applause.)

Dr. Durham: I wish to thank you, sir, for your hearty approval of our course. (Laughter.)

No report on the subject of Dental Chemistry.

The subject of Dental Surgery postponed till day after to-morrow.

On the subject of Dental Appliances, Dr. Patterson said: Failing to obtain a paper, I thought I would tackle some one outside, and I wrote to our friend, Mr. Selby, who says he will have a paper a little later.

On the subject of Dental Hygiene, the paper of Dr. R. H. Jones was received with applause.

Dr. Reminger: Let me commend that paper. If we were to go around in this town we would find that they give attention to sewerage, and I suppose you have a health officer, whose business is to go around and see that the rubbish is cleared up. You may go in the country and even there you will observe great cleanliness in the homes of the people; but when you look inside of the mouth, you find a different condition of things, the sewerage is bad and the aspect anything but inviting. We ought to establish a toothbrush manufactory in Winston, and we ought to arrange it so that they can be sold cheaply, and they ought to be imposed on the people like newspaper men impose the newspapers on the people. If they won't clean up the rubbish get the legislature to pass a law to make the people clean their mouths. Sometimes it is an advantage to have catarrh a little, for when you approach the oral cavity of some people, it is not very inviting. We do need to tell the people something; beg the mothers to have the children clean their teeth, and I tell you it would be a good thing to have the mothers do it sometimes, too. Some people say, "I clean my teeth every morning when I get up. Then I want to laugh. Wash your hands just before you begin mixing mud! You need to brush your teeth after you have used them. Brush them after breakfast and more than all brush them after supper.

Dr. Hillard: There was a lady in my town whose children had bad teeth. She expended about \$100 in having them put into good condition. She asked me, then, if something could not be done to save her two younger

children's teeth. I told her that a tooth brush and floss silk would do it. She started at that time, when her boy was four and her girl was six years old; now the boy is fourteen and the girl sixteen, and I examined their teeth last week and there is not a speck of decay anywhere. If I had to depend on ladies who kept the advice of the dentists like she did, I would have to go to plowing or something else.

Dr. Wyche: I rise to add my hearty endorsement to Dr. Jones' paper, and I find it is one of the most difficult things to get mothers to make their children clean their teeth.

Mr. G. H. Patterson: I had a pleasant visit from the Doctor about a year ago, and I would like to ask him to go back again, if he can help one patient. I have one who never cleans his teeth, and to all my efforts he says that he is going to get a brush and do it. The structure is good but it has been literally eaten away by tartar.

Dr. Spurgeon: We should emphasize the point that the patients should clean their own teeth. A great many have the idea that about all the dentist is for, is to clean teeth. If you can get them to get hold of the idea that it would be just about as impolite in them to ask us to clean their ears or face, as to clean their teeth, I think a great many of them would clean them at home.

Dr. Conrad: I had proof of that. A very pretty young lady came into my office and asked me to clean her teeth, and I said, "why don't you ask me to wash your face?" "Why," she said, "I always attend to that myself." "Well," I said, "if either has to be neglected, I want you to neglect your face and let me wash that, too." The young lady has not come back.

Dr. Thompson: It is a great pity that a paper like that cannot be brought before the public. If that could be done, it would be a very good thing; it is one of the most important preventatives of decay that we can suggest, if people would keep their teeth clean. Just think of it!

How many perfectly clean mouths do you see? It is a very rare thing for you to see what you would call a perfectly clean mouth. I have talked this to my patients over and over again, and I try to impress upon them the importance of keeping their teeth clean; I make them bring their brush and I show them how to clean their teeth, and I show them how by using a set of tin teeth, and I use every means to impress upon my patients the importance of cleaning their teeth, especially among younger patients.

At this point the session adjourned to meet the next day.

MORNING SESSION, MAY 26.

Call to order.

Roll call.

Minutes of last meeting read and approved.

Report of the Committee on Census report was as follows:

It was agreed to adopt a circular (changing the name, etc.) which was authorized to be sent by the Maryland Society to Congress showing that it is the desire of the profession in the United States to have this bill so amended that dentists will not be compelled to stultify themselves in answering questions of the census enumerators. And they simply want their representatives in Congress to see to it that this bill is so amended that dentistry shall be excepted from all tabulation just as the other professions are.

It was suggested that any member of the Association who knows a Congressman use his influence to secure the desired legislation.

Prosthetic dentistry. No report.

Dr. Turner spoke on the necessity of Chairmen of Committees making reports on the subjects under their charge, which was received with warm applause.

In answer to requests that he should speak on the subject, Dr. Turner said :

I appreciate very thoroughly the compliment that you have paid me, but if you will pardon me, to come down seriously to the discussion of this subject, I trust you will forgive the earnestness with which I have expressed myself, and I, of course, feel perfectly good-natured about the whole thing.

In regard to Prosthetic Dentistry, I scarcely know how to commence the discussion, except to say that I believe that prothetic dentistry means the application of artificial teeth. Now then, if the application of artificial teeth to the mouth is the true definition of the term, then I would like to suggest that this matter of bridge-work, which seems to have occupied the attention of a great many gentlemen of skill and ability, should be brought out. I have not had very much experience in that line, comparatively speaking, but there are many points yet to be learned about bridge-work. You will hear one man who says : "I am very thoroughly convinced that this is a step in the right direction;" and another man who says, "I believe you have to go very slow with bridge-work." There are many points which would be of interest to this Association upon this subject, and I feel that there are gentlemen present who would probably enlighten us upon the main points involved. There is the question as to whether the bridge should rest upon the gum, or whether it should be elevated or removed, separated from the gum, leaving a space between. Now, I saw a member of the dental profession in Atlanta putting in a bridge and he put his plate and fastened it right down on the gum and he contended that was the proper course. I differ with this gentleman.

Then another question as to what effect the ordinary band has upon the gum. It is frequently the case that where a bridge has been put in for months, and the gum is apparently in a normal condition, when you come to

examine you will find a piece of bridge work where the execution has been apparently perfect, and still you will find conditions which threaten to be so serious that decay will set in. My idea is that a bridge, where there are any number of teeth, ought not to rest directly upon the gum; there ought to be sufficient space to remove food as expeditiously as possible, and I feel that where I have tried to put a bridge down very closely, I have found more or less trouble, because the average patient is not very careful sometimes. I do not claim to have done very much in this line, and I am interested upon the subject, and I would like some gentlemen who understand these things to say something to this Association.

Dr. Morgan: I am willing to give you the benefit of what little experience I have had in bridge work, and more particularly from observation. I have been interested in the subject since the year 1879 when I saw the first all-gold crown that I ever saw. Like Dr. Turner, I disagree with those who follow the practice of adjusting bridges that rest upon the gum, or making what is sometimes called the saddle bridge. Saddle bridges, or bridges that are adjusted right over the molars or bi-cuspid's or cuspid's, it is impossible to keep clean; I believe it was Prof. Taft who said that he never got within three feet of a person wearing them that he could not detect the fact from the odor of the breath. I do not, in my own practice, undertake to make a bridge where I have not two abutments. I must have a lodgment at each end. The day of the insertion of ten, twelve and fourteen teeth upon three, four or five teeth is past and gone and those bridges are now put in in sections.

None of us will deny that we have yet determined no fixed set of rules by which we may adjust these bridges. A bridge that has more than one tooth beyond its point of anchorage, is in my opinion a very risky piece of work. We all have our peculiar modes, some having very much shorter cuts than others; some doing the work as we saw

here yesterday at one sitting, while others arrange their points of anchorage and afterwards adjust it on a model, having the piece finished up for insertion in the mouth after its completion. We had shown us at Morehead City last summer what was termed by Dr. Marshall the "anchor plate." Since then I have interested myself somewhat in these anchor plates, and as it seems, from those with whom I have talked since being away, that they are not very generally used or understood by us, that might be of more interest to you than a discussion of the bridge.

The anchorage plate is a plate that is made removable. Where there are one or two teeth remaining in the mouth we change our parallel and cap with crown; after that a band of gold is telescoped over the teeth and the plate is anchored to these telescopes, so that when the plate is removed from the mouth, or when the plate is inserted, the point of bearing is not upon the crown tooth so much as it is upon the jaw. Possibly the citation of a single case would be of more value than more dealing generalities.

A case presented itself at the office of a gentleman whose anterior teeth below were all that remained except the second bicuspid on the right side. Those anterior teeth were extracted, the first bicuspid having been lost some time previous; the second bicuspid on the right with the cuspid on the left were gone. An impression was taken after having the crown in position. From this impression a model was made; bands were made to adjust themselves to the crowns, and the plate carried into the mouth and the bands telescoped over the crowns. An impression was then taken with the plate and bands in the mouth. A model of fire clay was run. Upon the anterior portion six teeth were placed by soldering. This was better because of the solidity that it gave to the plate. The posterior teeth—the molars—were put on with rubber, and Gilbert's Granular gum was put on. It was then, when finished up, ready for insertion, and I am satisfied

that nothing that could have been done for this gentleman could have been so serviceable. The resting is perfectly firm, and in some instances the teeth that were comparatively loose under this treatment become quite firm and steady, even if they had been previously affected with Pyorrhœa Alveolaris. It seems to be the case in my practice that teeth which have been suffering with Pyorrhœa Alveolaris and which have been capped with the gold crown, which I regard as the greatest contribution to dentistry since the war, that teeth that have been loose become firm, and that frequently if the cap has been thoroughly and properly adjusted with due skill, so that there is no impingement of the gum, and the most of those with whom I have talked say that they can better adjust those that are manufactured than those that they make themselves. These teeth, I say, that are quite loose will become quite firm and steady in their positions. In the manufacture of these plates all pressure is relieved from the gum. All of you who have had an opportunity of observing the old fashioned clasps remember how the clasp just at the neck of the tooth irritated the gum. In making these anchor plates, we get rid entirely of that difficulty and in those that I have had an opportunity of observing, that have been in the mouth for six or eight months, the gum is perfectly healthy. (Applause.)

Dr. Smith: I do not feel like the Irishman who said he did not hear both sides of the question because it always confused him. I would like to hear both sides of the question. So far as I am concerned, I regard bridge work as a great boon. But I have never seen a saddle bridge put in, that had been worn any length of time, which has not given rise to inflammation and with serious consequences following. I have met those who said it was impossible to make bridge work in the laboratory, that it must be made in the chair. I do not make my bridge work at the chair. A great deal depends on getting a perfect impression. I force the modeling composition

around the tooth and let it stay there until it gets partially hard. After it gets partially cold I take a knife and cut out the modeling composition all around the tooth, take a little modeling composition that is very soft, run it through the flame of the lamp until it is very hot, drop this little ball of modeling composition into the impression, then replace it, and I get a most perfect impression—it is absolutely correct and it does not take it long to cool off. I take that out and send it to the laboratory and have a model run. The model is returned to me and I take my knife and cut about the teeth, cutting down a little, and after having examined the teeth I prepare that model and send it back to the laboratory, and my young man in the laboratory takes tin or lead foil, makes a band to go around that tooth allowing it to extend where I have cut away under the gum. He takes this pattern and cuts the gold; with a little wire he wraps it, putting it in the flame solders it, so it comes back to me as a band. Sometimes I find that I have to send it back and cut it, but in the majority of cases the band fits the tooth. I mark where I want it cut down, and send it back to the laboratory, where he has swaged a cusp for it. This he solders and sends it to me again very soft. I put it into the mouth and let the patient bite into it, so a perfect occlusion is made. Then I send it back again and he fills it up with solder, then he sends it to me again and I take it out in a plaster impression. Then the teeth are adjusted, first trying the color, and then the bridge is ready to put in.

I do not approve of bridge work in all cases, gentlemen. There has been so much harm done in bridge work. It is not the fault of bridge work but the fault of some men. Do not undertake to put bridge work into the mouth unless you are certain that it will be good for a number of years. I have seen bridges put in that after five or six months failed and came to pieces.

Another thing, try and have constant communication between your patients and yourselves. My patients are

pledged to come to see me every six months, in some cases every three months. I would not put in a bridge for a patient who would not promise to consult some dentist every six months. (Applause.)

Dr. E. L. Hunter: I fear that some of the gentlemen think I am opposed to bridge work entirely, for the simple reason that I have condemned its abuse. I just wanted to say that because I feared I stood before the Society as condemning bridge work.

Dr. Cryer: It is one of the best processes, this capping the teeth with gold crowns which become anchorages to hold plates. Dr. Morgan spoke of the tooth becoming firmer. I think it is perhaps for this reason: A tooth standing alone is like a man standing alone—he has nothing to lean against. By putting a plate in by this process it is held in position, and at the same time the crowned tooth holds the plate in position. (At this point Dr. Cryer spoke of a case before the Society—that of the elderly gentleman who had the cancer removed from his nose. The gentleman came forward and Dr. Cryer explained to the Society the details of the process of making the partially artificial nose.)

Dr. Thompson: I want to add my testimony to all that Dr. Morgan has said with regard to the anchor plate, and in addition I would like to suggest making metal models. This (showing model) is the model of a case I made in practice. Of course in bridge work you could not, at least I do not recommend using those extension bridges and using the saddle. I do not recommend bridge work where you do not have two abutments, except that I differ from Dr. Morgan in that respect that I frequently insert front teeth, one or possibly two teeth on one root. In this case I crowned the first bicuspid on the left and the second bicuspid on the right with gold, made a telescoping band to fit over them, and the great advantage you have here by a metal model, you can get that direct from the impression. Your telescoping band you can fit

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to these crowns and then attach your plate to this band and you have no breaking down; in pressing up your plate your model holds its shape and you get a more accurate fit, I think, and your bands are held better in position. I have been using, since Dr. Marshall recommended it at Morehead City, this process very extensively, and it has taken the place of bridge work in my establishment; it is nothing more than removable bridge work. My experience has been as with Dr. Morgan; where you have teeth with a double duty placed upon them, nature comes to their assistance and they become firm; I have yet to see a single tooth that I have not thought was improved by this attachment.

As to Dr. Smith's process of making bridge work, I do not agree with him in making bridge work in the laboratory; I can not make an accurate fit of the neck of tooth except in the mouth. In the first place, I can not get an impression of the part that I wish to hook closely if my band is beneath the gums. In preparing my crowns I cut it down in a conical shape, and I contend that you can not get an accurate impression of the neck of the tooth beneath the gums. After I get my teeth all ready for receiving the crown, I can fit it while I am getting an impression of it; I put my crowns direct to the teeth. In making a bridge, I have an original and quick method. For instance, if I were going to bridge from this second bicuspid to the third molar, I would prepare those crowns and prepare the teeth for receiving the crowns and crown them; I use nothing but gold crowns—I have abandoned the porcelain-faced crowns; I then stamp up the gold crowns; those crowns are then trimmed so that they do not touch the gum. I do all this while the patient is sitting in the chair. I place the crown which I have stamped up in position in contact with the crown upon the natural teeth, the patient closes down and presses the wax down, holding it in position; then I mark where this crown comes in contact with the crown upon the teeth so

that I can replace it after taking it from the mouth. I remove that crown and the crown from the natural teeth, and with my pliers I hold them together and drop a little piece of solder just between them which attaches them together. That model crown is attached to the crown which goes upon the natural teeth that is replaced in the mouth; if the crown stand up a little, the teeth come right down and press it into place. All these crowns I use, in making, pure gold; it is very soft indeed; if you have got it a little too high, the teeth will put it in place; if you have got it too low, you can run underneath and raise it; then, by carefully removing the whole skeleton, you solder it. These model crowns are filled in solidly; I do not pretend to try to leave a vacuum there, but I fill them, using for this purpose the old filings, covering them over with the solder, and you can see how quickly you can make a bridge of that sort—you can do it at one sitting. While I have the patient in the chair I can stamp these crowns up in two minutes, and, if you wish, by keeping the patient waiting a short time I can have the bridge ready to go into the mouth; you can get it up as rapidly as you please, and you can construct a bridge of this sort more quickly than any thing that I have ever seen. It is solid metal all the way through, and I have bridges of that sort that are being worn from the cuspid back to the third molars, and they are perfectly strong and satisfactory, never having had but one to give way, and that was one of the first that I ever constructed. This is my process of making bridges.

Now, in making bridges of that sort, I always leave a space between the gum and the bridge, so as to give plenty of room for keeping it thoroughly cleansed.

I wanted to say something on the subject of metal models. I have used almost exclusively metal models; some of you saw yesterday how I prepared the impression. After the impression in plaster is taken, I have a little saw that I made myself out of a piece of clock spring, with

which I saw through the impression an air-gate allowing the air to pass out. In operating in metal, as it comes together, unless you have extracted the air, a little portion of air is collected under there, and you have a defect in the model. By passing this little saw through you have plenty of escape for the air, and the metal will give you a perfect model. These models are very easily made. After you have got the impression and sawed little air-gates through it, you take a piece of tin and just surround your impression; that tin-foil is wrapped right around the outside of your impression; that is the only preparation you have to make of the impression. I do not use marble dust with my impression; this impression is surrounded by plaster dried out thoroughly, then you pour block-tin into the impression after it is dried, and you get a perfect model of it. As you know, there is a slight contraction of the tin and an expansion of the plaster, but the contraction of the tin is more than the expansion of the plaster. You have a metal then that you can work upon without any danger of breaking down; your plate comes out polished—it can be trimmed up. And another advantage of the metal model: after you have placed it upon the articulator, you go to work and invest it, press up your plate, and then you can replace it upon the articulator and see that you have gotten your articulation correct; you place this back upon the articulator, and, by bringing the articulator together; you can see exactly where it needs grinding. These are a few of the advantages of metal models.

Another thing I have said, wherever I go: the suction plate covering the roof of the mouth is one step in the right direction. We have no idea what a great inconvenience it is to have the roof of the mouth covered; it was intended by nature to be left uncovered, and we must avoid covering wherever we can, I am using these anchor plates wherever I can, and I find with the metal models you can make an accurate fit. (Applause.)

Dr. Smith: I do not propose to be misrepresented by my friend Thompson, here; I did not say, and I do not wish to be put on record as saying that I did not fit my bands in the mouth. I said that I did not *make* the bands in the mouth. If it is possible to get a correct impression of a tooth, it is certainly much more easy to get a perfect adaptation of a sheet of gold to that tooth in the laboratory on the model than it is in the mouth, where you are embarrassed by saliva and the teeth and lips of the patient. If Dr. Thompson will pursue my method, he can get a perfect impression.

At the conclusion of the discussion between Drs. Smith and Thompson, Dr. Holliday said:

I have had very little experience with bridge work. I have done considerable crown work, but not much bridge work; and, after the ground has been gone over so thoroughly by Dr. Morgan and Dr. Thompson, I do not know that I have anything to add that would be new or different from what they said. I agree with the gentlemen that have gone before, in the adjustment of the crown. I pursue Dr. Thompson's method, somewhat; I think that I can do it better in that way. An impression can be made, and a perfect impression of the root, too, even under the margin of the gum. In preparing the root, it necessarily presses the gum out of the way, and the modeling composition will force itself under the margin of the gum.

After repeated calls, Dr. Alexander said:

I have really nothing to say. All the crowns I make, I make them with the patient in the chair. I do not use models or take an impression.—*Southern Dent. Journal.*

[To be Continued.]

ARTICLE II.

THE CONDITION OF DENTINE IN PULPLESS TEETH.

BY DR. W. C. BARRETT, BUFFALO, N. Y.

Read in the Section of Dental and Oral Surgery, at the Forty-third Annual Meeting of the American Medical Association, held in Detroit, Mich., June, 1892.

I had promised the Secretary of this Section that I would prepare and read a paper at this meeting upon the "Condition of the Dentine in Pulpless Teeth." It was a subject upon which I had bestowed some thought, but with the literature of which I had not made myself thoroughly acquainted. I had read Prof. Miller's work on "The Micro-organisms of the Human Mouth," and his communications to the various journals, notably *The Dental Cosmos*, but not with this special subject in mind. I had not collocated his writings upon this theme, and hence had not collated them. When in pursuance of my plan this had been done, I was astonished at the thorough manner in which the ground had been covered.

Had I examined my subject earlier, I should not have attempted an excursion in this field; but having engaged to present this paper, I will endeavor to redeem my promise, premising at the outset that I can do little save to call attention to what has been done by Prof. Miller in this direction, a work which does not seem to be fully appreciated, and which perhaps will not be until each attempts, like me, specially to study it for himself. In view of his exhaustive experiments, one can but wonder at the seemingly crude theories yet held and taught by some men to whom we naturally turn for illumination. Perhaps I shall do more good by placing Dr. Miller's comprehensive studies before you for discussion, than I could by effort in any other direction, for it must be remembered

that his are not mere generalizations, such as mine must necessarily be; they are the results of a long series of conclusive, scientifically conducted, original experiments and observations, and they are not to be overthrown by any inductive reasoning whatever. In view of the overwhelming original testimony which he introduces, no man has the right to dispute his deductions until he is fortified by a like mass of opposing facts, deduced from like carefully conducted experiments or until he can indisputably demonstrate that the conclusions reached by Dr. Miller are not warranted by the results obtained. Mere mental speculation, however plausible, cannot be accepted against thoroughly demonstrated facts.

The dentine, deriving its nutriment from the pulp of the tooth through the dentinal fibrillæ, is separated from all the other tissues of the body, through investment by the cementum and the enamel. The latter tissue is not only comparatively devoid of living matter, but it is not in direct relation with any tissues save the dentine itself. For our present purpose, the enamel may be looked upon as a simple protecting cap, whose office it is to preserve the dentine and pulp from injury.

The cementum is of a different character. It is but slightly differentiated from true bone. It is in relation with a periosteal membrane and it is nourished like bone through a system of lacunal corpuscles, connected by canaliculi. In young teeth it is not infrequently the case that there is even a kind of system of Haversian canals, traversing the cementum and dentine between the pericementum and pulp, whose office it is to assist in maintaining the vascular supply, and incidentally, perhaps, to afford nutriment to the deeper cementum corpuscles.

The dentine is yet more differentiated, and in its structure has lost the lacunal corpuscles, while the canaliculi are modified into the dentinal fibrillæ. Their office is not materially changed, nor are we to suppose that the contents of the dental tubuli differ very widely from those

of the canaliculi of true bone. They form the living portion of the dentine, as the lacunal corpuscles and the canaliculi form that of the bone. The dentinal fibrillæ are in connection with the vascular pulp, and from it derive the nutriment necessary to their continued life. The corpuscles found in the bone and in cementum are absent, and hence there is little that bears a resemblance to that reticulum of true bone which forms its lamellated structure. At the extremities of the dentinal fibrillæ, we have the irregular interglobular spaces which mark the boundary line between dentine and enamel, and which may, perhaps, be considered as modifications of the cementum corpuscles, but they are not intimately connected with the dentinal structure.

The dentinal fibrillæ, depending as they do upon the vascular pulp for nutrition, certainly lose their protoplasmic vitality when separated from it. Let us consider for a moment the condition of the dentine in a tooth, the pulp of which has, without medication, just been forcibly removed. The fibrillæ have been freshly torn from their relations with the pulp, and remain, filling the dentinal tubuli as before their violent separation. Like all protoplasmic material, they are composed of the great quaternary of elements which enter into the composition of all organic elementary structures. But the dentinal fibrillæ probably also contain other elements, such as sulphur and phosphorus, which make it more near the nature of albumen. Indeed, it is probable that if we consider it as clearly albuminous, we shall not do much violence to nature. Carpenter says that this substance is the proper pabulum of the animal tissues generally, and so the dentinal fibrillæ, possibly modified somewhat, may be looked upon as albuminous in their nature.

The dentinal tubules, which contain the fibrillæ, are exceedingly minute. For the putrefaction of the contents of the tubuli, it would be essential that putrefactive organisms should enter them. While it is quite possible

that these may penetrate the tubuli, it must be to but a limited extent. In the article in *The Dental Cosmos* for May, 1890, upon "The Decomposition of the Contents of the Dental Tubuli," Dr. Miller shows that from their minute size and the very small amount of nutriment for the micro-organisms which they contain, any bacteria which enter them must soon perish from want of pabulum, to say nothing of the fact that they are mostly ærobic, and so could not possibly live in the tubules for any length of time.

But not satisfied with *apriori* reasoning, he commences a rather remarkable series of experiments and observations, from which he incontestibly deduces the conclusion that bacteria do not penetrate the tubuli of undecayed dentine to any marked extent; certainly not enough to cause any necessity for the disinfection of the dentinal substances, in teeth in which there has been no decay within the pulp canals. I need not enlarge upon this. The record is open to the inspection of all, and no one has yet dared to take issue with Dr. Miller upon this point. It must be accepted, that in the dentine of the roots of teeth in which decay has made no progress, there is no infection of dentine that demands any antiseptic treatment, aside from that usual in pulp canals.

What then becomes of the contents of the dentinal tubuli? It is but necessary to consider their character to form a clear estimate of this. The dentinal fibres cannot be considered as pure albumen, for that is only found in connection with other substances in the body. But whatever its exact composition, it presents certain characteristics, one of which is its tendency, when at rest and separated from living tissue, to dissociate the watery portions, and to form a dried residuum which is insoluble. This condition may also be produced by most acids, by the metallic salts, and by creosote. The natural tendency, then, for an albuminoid fibril, would be to assume a mummified condition, most conducive to its indefinite

preservation when kept in the state in which it will be found in dentine of a tooth root.

Fibrin is but comparatively slightly differentiated from albumen. It contains the same elements, but it offers certain physical characteristics that distinguish it. Albumen is coagulated by heat, and by certain agents. Fibain coagulates spontaneously when exposed to the air. If, then, the fibrillæ of the dentine approach fibrin in their characteristics, they will undergo the change called coagulation without the intervention of any medicinal agent whatever. It is in this condition that, if sealed up from external influences, they present the very best state for the preservation of the tissue in which they are found. Hence that condition of the dentine is best in which the contents of the tubuli have been coagulated, or separated from the watery elements, and permitted to become a kind of minute mummy without their investing sheaths.

But the investigations of Miller, to which I have already referred, determine another matter. He did not find that the mouths of the dental tubuli, in teeth from which the pulp had been removed, were opened toward the pulp chamber. He had under examination nineteen teeth. In ten of the roots of these he found the canals to be completely or partially lined with a homogeneous structure, containing very few or no tubuli, but occasionally a formation resembling a bone lacuna, and bearing a much more near resemblance to cementum than to dentine. This layer is impenetrable to micro-organisms, and therefore forms a protection to that tissue when the pulp has been removed. We find, then, that the dentine is not only protected by the cementum on its external aspect, but very often by a modification of this tissue on its inner surface.

There is, therefore, very little danger of infection of the contents of the dental tubuli. But even if this were possible, I cannot conceive that it would matter much. The

amount of infectious matter would be so small, and the chance for the penetration of the gaseous products of decomposition through the dentinal tubuli, past the zone of demarcation between dentine and cementum, and finally through the cementum corpuscles and canaliculi, which are themselves filled with living matter, would be so remote, and its influence upon the pericementum so infinitesimally small, that it seems folly to take it into consideration in the presence of so much more potent factors.

Clinical experience, too, as is so plainly stated by Dr. Miller in the article to which reference has been made, does not sustain the theories of those who insist upon the possibility of infection from dentine. If the contents of the pulp canal be completely removed, the territory made thoroughly aseptic and the space finally filled, there is, so far as I am aware, no record of any trouble from the dentine. Even admitting that there exists within the dentinal tubuli matter which is susceptible to putrefactive changes, it is too small in amount to induce any disturbing condition in the presence of a pulp canal, carefully filled with a material which must seal the exceedingly minute mouths of the tubules wherever they are not already stopped by the modified dentinal layer of which Miller speaks. In the presence of so much more important things, it seems like bad judgment to elevate such a molehill into a mountain. It is taking tithes of mint and cumin, and neglecting the mighties matters of the law. To elevate such small matters into prominence in private, has a tendency to induce carelessness in things that need more attention. I doubt whether there ever has been a case of reinfection of the tissues about a tooth that has had its root filled after antiseptic treatment, that cannot be directly traced to some imperfection in the manipulation, or to some infected pockets outside the tooth itself. It is well known that the usual place for the formation of an infected pocket is at or near the apex, and that there may be a penetration of the micro-organisms and the formation of infected pockets for some distance back in the bone. I have myself seen at least three such, extending back from the point of an incisor tooth until the last one was over the second bicuspid, and each of these separate

pockets connected with the original one at the apex of the incisor. They were only reached by a long incision through the gum and external alveolus, extending from one to the other until the last one had been reached. If the infection had been from the dentine, it would have manifested itself quite differently.

Undoubtedly there are cases in which the infected spot is at some point in the pericementum between the gingival margin and the apex of the tooth. But this does not by any means prove that it came from infected dentine. Perhaps, after the apex of the tooth, the most usual place for the formation of an abscess is at the bifurcation of the roots of a bicuspid or molar. I believe this to be due to the fact mentioned earlier in this paper, that something analogous to an Haversian canal there penetrates the cementum and dentine, from the pericementum to the pulp. I have demonstrated such many times. Not infrequently an abscess refuses to yield to the usual treatment through the pulp canal, and for the reason that the medicaments fail to reach the infected point. But such instances cannot be said to be produced by infected dentine. There is, in truth, another foramen analogous to that at the apex, and it becomes septic in precisely the same manner as does the latter.

In what I have previously urged, we have presupposed that caries had not commenced within the pulp canal. And yet we are well aware that in cases in which the pulps had been long dead, and there has been extensive decay of the coronal portion of the tooth, there was caries of the dentine, commencing within the pulp chamber and extending down the canal. In instances like this, of course there will be thorough infection of the dentine. It will not, however, be due to decomposition of the contents of the dental tubuli, but to infectious matter, which may find its way into the hollow from external sources. It must be as manifestly improper to fill such a canal without removing the carious portions, as it would be to fill a cavity from the outside without careful excavation. Here will be an instance in which the reaming out of the canal to the depth to which caries had penetrated would be eminently proper practice. It is very seldom that this

decay will extend far down the root canal, or be very deep, without such destruction of the crown and cervical portions of the root as to make preservation practically impossible.

As regards the use of coagulating agents in the treatment of root canals, I cannot conceive of any objection to them. If by any it be thought necessary that dentine should be disinfected and made aseptic, this can only be accomplished by agents which have the power of penetration in a marked degree. These are usually coagulants, like chloride of zinc, bichloride of mercury, etc. Upon this subject I can only refer to the experiments and observations reported by Dr. Miller, in an article on "The Relative Rapidity with which Various Antiseptics Penetrate Pulp Tissue," published in *The Dental Cosmos* for May, 1891.—*Dental Pract. and Advertiser*.

ARTICLE III.

AN ABNORMAL PULP CANAL.

BY C. F. W. BODECKER, M. D. S.; D. D. S.; NEW YORK CITY.

PROFESSOR OF EMBRYOLOGY, UNIVERSITY OF
BUFFALO, DENTAL DEPARTMENT.

Mrs. W., aged about thirty-five years, with a good constitution, was about two years ago suffering from severe pulpitis of the left upper second bicuspid. The tooth, five years previously had been filled with oxyphosphate cement. The filling was now taken out and an attempt made to devitalize the pulp, but the application had to be removed, as the pain became too intense for the patient to bear. The pulp was then treated for a few days, and when the inflammation had subsided it was capped and the cavity filled with gutta-percha.

The tooth remaining very sensitive to thermal changes, after about one year the patient decided to have it treated again. The filling and cap were removed, the pulp being

found apparently in a normal condition, but as the patient insisted upon having either the pulp or the whole tooth taken out, I decided to make an application of the chloride of methyl spray and extricate the pulp.

A microscopical examination of the coronal portion of the pulp showed that, with the exception of a few spots having calcareous depositions, it had been in a normal condition. The application of the methylic spray was very painful, but the removal of the pulp gave the patient but little pain. The canal was enlarged with Morey drills, disinfected with a solution of peroxyde of hydrogen, dehydrated with absolute alcohol and hot air, and immediately filled with chloro-percha. The introduction of the filling material into the canal produced intense pain. After repeated applications of counter irritants and ice to the gum above the affected tooth, the pain gradually subsided.

Three days after this, the patient became intermittently afflicted with neuralgic pains of that side, affecting the eye, the ear and the neck. The longer the duration of these paroxysms, which lasted from one to three hours, the more severe became the pain. The tooth in this stage exhibited no signs of pericemental inflammation, nor was there any pain produced by pressure upon the gum surrounding it. I then consulted with her family physician, who prescribed tonics and anti-neuralgic remedies, but without the slightest relief.

The seventh day after the canal had been filled the tooth became sore to the touch, when I concluded to remove the filling from the canal. This produced instant relief. In removing the filling, I noticed that as soon as the instrument was pushed along the distal portion of the canal, about the middle of the root, the patient experienced great pain. It appeared to me that either a small portion of pulp must have been left in this place, or that there was an enlargement of a dentinal fibre. I made an application of a saturated solution of hydrochlorate of cocaine, and

with the largest Morey crown drill reamed out the canal, which was found to be perfectly straight. As the instrument reached about the middle of the root it produced very severe pain, but as soon as the drill had passed this sensitive point it gave no pain whatever.

Upon the removal of the drill I found some blood in the pulp canal, which was thoroughly rinsed with water and dried, when an application of pure carbolic acid upon cotton was inserted.

A thorough examination the next day proved that the pulp gave off a branch running at right angles toward the distal portion of the root. This branch was about as large as the main body of the pulp in that portion of the tooth, and was supplied with blood-vessels. I then concluded to coagulate a portion of this pulp tissue by successive applications of pure carbolic acid. As there is danger of pericemental irritation after repeated use of this remedy, I closed the apical foramen with a small piece of cotton saturated with melted paraffine.

After applying the carbolic acid for six days, I removed the paraffine from the apex of the canal, and filled this portion with gutta-percha. The remainder of the pulp cavity was filled temporarily with cotton, saturated with a fresh solution of iodoform in sulphuric ether, and the cavity was closed with gutta-percha. After two weeks the temporary filling and cotton were removed again, and tin foil was substituted. The tin was introduced into the canal by means of small burnishers in the engine, the upper portion being filled with gutta-percha. All the neuralgia has disappeared, and the tooth has given no trouble since.—*Dental Pract. and Advertiser.*

ARTICLE IV.

DR. W. H. DWINELLE.

There is not an dentist in America who will not sigh with regret when he learns that the active days of usefulness of Dr. Dwinelle, of New York, are over. He has retired to his early home in Cazenovia, there to spend the last years of a long and honorable life in the quite retirement of a country home. What adds another pang to the general sorrow, is the knowledge that he is but inadequately supplied with money for his old age. He has always given as freely as he has received, and spent time and money lavishly in the service of the profession which he has so honored, and to which he has been so devoted. A few years ago, an unfortunate speculation swept away that which he had accumulated, and Dr. Dwinelle was left without sufficient provision for his old age.

We are not violating any of the rules of decorum in making these facts known, for it is through no misdeeds of his own that Dr. Dwinelle has met these misfortunes. Had he been of a selfish, grasping, avaricious nature, he might have been a rich man to-day, for the opportunities have been his to accumulate, had he not loved his profession and his professional brethren better than he loved himself. There are those occupying prominent positions to-day, who use those places for their own selfish ends. Dr. Dwinelle never did this, and his present poverty is a thousand times more honorable to him than would be the riches which have been attained by men who sacrificed others to their own advancement.

There is not a dentist in America who is not in debt to Dr. Dwinelle. There is not one who is not reaping the benefits of his public profession or labors—who has not directly profited by that which was the result of Dr. Dwinelle's earnest study and self-sacrificing devotion to

his profession. If he could receive but a tithe of this, his old age would be surrounded by everything that he could wish. Will not the dentists of New York State, especially, remember him now when his days of usefulness are numbered? At the very least, they can drop him a letter of sympathy and appreciation, to warm the heart which was never cold to any brother dentist's appeal. If they will enclose something a little more substantial, it will not be taken amiss. It is not charity. Let it be a token of goodwill and affectionate remembrance to one whose career has been honorable to himself and serviceable to his brother practitioners. How many will remember Dr. Dwinelle when the glad Thanksgiving Day shall come, and testify their gratitude and sympathy to one whose sympathies never yet slumbered when dentists or dentistry were concerned? He may be addressed at Cazenovia, N. Y., or if any one desires to unite with his brother dentists in doing something to smooth the declining years of the honored old veteran, let him address Dr. S. G. Perry, 46 West 37th street, New York City.—
Dental Pract. and Advertiser.

ARTICLE V.

A NEW REGULATING DEVICE.

BY EDW. C. KIRK, D.D.S.

The following contribution to the list of devices for correcting one of the most frequently occurring forms of dental irregularity may be found useful. I have obtained very satisfactory results with it in the two cases where I have used it. The object to be accomplished in both of these was to move the incisors outward for the purpose, in the first instance, of increasing the size of the upper arch,

and in the second instance, where the upper central incisors closed inside of the lower incisors, of correcting this defect.

This appliance is constructed as follows: A broad clasp of platinized gold is thrown around each of the sixth-year molars, the opening of the clasp being at the distal buccal angle of the tooth or on its distal proximal surface. These clasps are yoked together by a narrow silver plate simply to give solidity to the fixture and cause the two molars to act as a single abutment. On the buccal aspects of each molar clasp is soldered a section of gold tubing about three-eighths of an inch in length; the tubing used is the hinge tubing of watch-case makers. The distal end of each tube is closed with a drop of gold solder. When the appliance is thus far completed, it is placed on the model and a section of piano wire bent to conform to the arch, impinging on the buccal aspect of the teeth about the middle of their crowns. The length of the piano-wire spring and the relation of its curvature to the labial aspects of the incisors is made such that its form will be that which the arch of the anterior teeth are to take and permanently retain, or, in other words, the wire is to be bent to the form of the arch which it is desired the teeth shall form when the correction is completed.

The wire will now have proximately a U-shape. The free extremities of the wire are to be cut to the proper length, so that when introduced into the tube-sockets with the fixture in position in the mouth, the arch of the U will stand nearly one-quarter of an inch anterior to the incisors and about the middle of their crowns. After the fixture is adjusted in the mouth, the teeth to be moved outward are to be firmly ligated to the piano wire by means of fine gilling-twine or silk. The especial advantages of this fixture are that it is cleanly and easily removable for readjustment or cleansing. The traction force is exerted directly outward in the median line, or, if desired, its direction may be modified by tying the ligature to the wire

on either side of the tooth to be moved. The amount of force exerted is absolutely under control, and may be modified at any time by changing the length of the legs of the U-shaped wire, or by using a wire of smaller diameter, or by the method of tying the ligature to the wire.

Not the least important advantage of the appliance as described is, that by having proper regard for the curve of the spring and length of its sides in relation to the curvature of the corrected arch, the fixture becomes practically automatic from the fact that the limit of resilience of the spring is reached at the moment the irregularity is corrected. Consequently, when the work of correction is done, the spring ceases to act. I have found much satisfaction in the use of electro-gilded piano wire, not only in the cases described, but wherever I have occasion to use piano wire in regulating teeth. The deposit of gold is amply sufficient to protect the wire from oxidation during a reasonable time while in use in the mouth, and the unsightly staining of the teeth by iron salts is thus avoided. The gold surface is also an advantage when it becomes necessary to unite lugs, loops, or other fixtures to it by means of solder.—*Cosmos*.

ARTICLE VI.

THE SURGERY OF THE TONGUE.

In an excellent paper on this subject read before the American Surgical Association, May 31, 1892, Dr. Dandridge presented the following conclusions:

1. Sufficient experience has been accumulated to show that removal of cancer of the tongue prolongs life, adds to the comfort of the patient, and further affords a reasonable hope of permanent cure.

2. All operations should be preceded by an effort to secure thorough disinfection of the mouth and teeth.

3. In the treatment of continued ulcers and sores on the tongue, caustics are to be avoided and all sources of irritation removed.

4. Persistent sores on the tongue should be freely removed by knife or scissors if they resist treatment.

5. When the disease is confined to the tongue, Whitehead's operation should be employed for its removal.

6. In this operation the advantage of preliminary ligation of the lingual artery is not definitely settled, but the weight of authority is against its necessity.

7. The advantage of leaving one-half the tongue in unilateral disease must be considered undetermined, but the weight of positive experience is in its favor. In splitting the tongue into lateral halves, Baker's method of tearing through the raphe should always be employed.

8. A preliminary tracheotomy adds an unnecessary element of danger in the removal of the tongue in ordinary cases.

9. When the floor of the mouth has become involved or the glands are enlarged, Kocher's operation should be employed, omitting the spray and preliminary tracheotomy.

10. Removal of the glands by a separate incision after the removal of the tongue, must be considered insufficient.

11. Volkmann's method still rests on individual experience. Its just value cannot be determined until it has been subjected to trial by a number of surgeons.

12. Thorough and complete removal should be the aim of all operations, whether for limited or extreme disease.

13. By whatever method the tongue is removed, the patient should be up and out of bed at the earliest possible moment, and should be generously fed.—*Journal of the American Medical Association.*

Editorial, Etc.

CULTURE AND PROFESSIONAL SUCCESS.—The September number of *The New Review* publishes a paper on "The Relations of General Culture to Professional Success," from the pen of the late Sir Morrell Mackenzie. It has been commented upon by the *Lancet*. The article raises an issue which is pertinent to the dental profession, inasmuch as it has been proposed in the National Association of Dental Faculties that "after the session of 1892-93 four years in the study of dentistry be required before graduation." All educational methods are being subjected to stringent scrutiny. Medical schools and dental colleges have been and still are engaged in revising their curricula and extending the periods of study. Hence an article like that cited raising the great question how far general or "liberal" culture, as contrasted with special, technical and professional education is conducive to professional efficiency and success is worthy of careful attention.

The article is strongly in favor of a wide, general culture as the best preparation for the more special training which every profession demands from those who aspire to enter it. The author's grounds are various, but they may be summed up under two heads: first, that such culture confers breadth and flexibility of mind and renders the acquisition of special knowledge easy; and, secondly, that it develops a knowledge of human nature, and hence assists in enabling us to treat our clients or patients not as mere "cases" but as complex, sensitive, and highly organized men and women.

There is a strong, utilitarian wave of opinion now prevalent, and it is becoming generally assumed as an axiom, that all training for a profession should be directed to the special needs and work of that profession, and that liberal study, however pleasant or refining, must, in the stern struggle for existence, make way for subjects more practical and more immediately and obviously useful.

Those most imbued with the spirit of the new era should be reminded that the preparation of the intellect for the

reception of knowledge is an object hardly less great and urgent than the character of the knowledge which is imparted. Some such preparation is indispensable. The medical or dental student needs grasp and strength of mind; the capacity to note resemblances and differences; the power of determining what amount of evidence is sufficient to warrant a given conclusion; some capacity of reading character, so as to estimate correctly a patient's statements and to eliminate the personal equation. He needs to be cautioned against haste, inaccuracy, prejudice and preconceived opinions, fallacious reasoning, confused or contradictory ideas, want of tact, etc. These are formidable requirements, and the question is whether they can be met by any process less tedious and troublesome than that involved in a good preliminary education. The great danger of dental education in the present day is that raw youths with wholly unformed minds and destitute of any correct ideas regarding observation, evidence and reasoning, but with a natural aptitude for handling tools will produce specimens of workmanship which are accepted as evidences of peculiar fitness for dentistry, and they then come to imagine that little else is necessary. "The training thus commencing and ending in mechanism is discreditable, not because of its mechanism, but because being one-sided and partial it necessarily fails to accomplish that which it promises. Such training may make dental laborers, tradesmen, or artisans; but never dental artists, or scientific mechanicians; nor can the dentistry which they practice be, in any respect, identified as a branch of the art of medicine. It requires the broadest education of boyhood to counteract the necessarily narrowing influence of the professional studies of manhood; and it demands the largest possible infusion of purely scientific teaching, during professional pupilage, to correct the matter-of-fact influence of practice. In this lies the great error of American practical systems of education. They teach boyhood to take a utilitarian view of every lesson learned, and encourage young men to neglect studies in which they cannot see some prospective pecuniary value. Limitation, first in the amount of mental culture; secondly in its direction is thus made to combine with the inevitable influ-

ence of all exclusive pursuits, whether of science or business; the result is a rapid increase, in all professions, of men whose vision is limited by the narrow horizon of their special occupation, and who possess none of that large minded liberality, which is the outgrowth of a generous education. It is by such early restriction of thought and action within the narrow grooves of life's future pursuits that a merchant so often loses all power to enjoy the fruit of his toil, a physician is unknown beyond the sick-room, a surgeon contributes nothing to the cause of science, and a dentist holds no social position."

R. G.

Monthly Summary.

INFLUENCE OF HEREDITY.—*The Medical Record* gives an account of a series of experiments undertaken by Dr. C. G. Lockwood, of New York, to determine the power of transmission of mutilations in animals. White mice were selected, because they begin to breed when but thirty days old. They were bred "in and in" for ninety-six generations, all the sickly and defective ones being killed. Pursuing this course, notwithstanding the close breeding, at the end of that time the animals were larger and finer than the first ones.

The tails of the original pair were cut off. When they had young, a strong pair of these were selected, their tails cut off, and they were put in a cage by themselves. A pair of their progeny were selected, and the same course pursued. Thus in each instance brother and sister were the ones chosen for parents of the next litter, and in every case their tails were clipped. In seven generations young mice began to appear without tails, and he finally produced a perfect breed of tailless mice.

He then commenced the reverse process, by crossing a mouse without and one with a tail, alternating the sexes of each generation, and finally he got a breed of full-tailed mice again. Thus a persistence in removing the tails, and con-

tinued in-breeding of the same families, produced mice without tails; but when these were crossed with mice of the same origin, but possessing tails, there was a return to the ancestral condition, the hereditary tendency toward mice with tails being much the stronger.

Many experiments have been tried to determine the force of transmission of parental peculiarities. All experience teaches that bodily and mental traits are inherited. All breeders of animals know that it is possible materially to vary a type by judicious crossing and persistent in-breeding. But the permanence of such variation is a matter of speculation. If all horses were allowed to run wild, there is little doubt that the race horse and the cart horse would soon lose their distinctive traits, and there would be a tendency toward the original type. So, if all dogs were withdrawn from man's dominion and care, there would be a universal degeneration toward their wolfish ancestral traits. There are few who do not admit that varieties and species may have been produced by peculiar environments, and that the long continued disuse or destruction of any organ will finally result in its disappearance. Yet there are some stubborn facts which refuse to conform to the supposed general rule, and among these none is more striking than the persistence of the hymen, notwithstanding its long continued obliteration.—*Dental Pract. and Advertiser.*

MAL-OCCLUSION OF ARTIFICIAL MOLAR TEETH —

Sometimes dentists find a great deal of difficulty in properly articulating artificial teeth. When the denture is completed it is found that the molars strike too quickly, while the anterior teeth do not occlude at all. It becomes necessary to grind off the molars until the cusps are entirely removed, and a disagreeably smooth surface, unfit for mastication, is the result. Often, too, there is an annoying "click" when the teeth are brought together.

Usually this is the result, either of crowding the anterior portion of the wax articulating model beyond the point at

ch it rested when the bite was complete, or of allowing the anterior portion to rise, either of which will make the plaster s of the occluding molars too short. The "clicking" is to imperfect occlusion.

The undue length of the molar teeth may be, in some instances, owing to other causes, such as an improperly positioned articulation, or to the springing of the posterior portions of the plate when a rubber base is used, but the most common cause is that first quoted.

Many a perfect fitting plate has been made almost useless by presenting two inclined planes upon occluding teeth. It loosened by sliding backward or forward down this inclined plane, while perfect mastication is effectually prevented. More dentures fail by reason of bad occlusion, than through a poor fit.—*Dental Pract. and Advertiser.*

ETHER VERSUS CHLOROFORM.—The conclusions of the author, based upon fifteen years' experience with chloroform and fourteen years' experience with ether, may be briefly summed up as follows:

- First, that ether is far less dangerous than chloroform.
- Second, that the anæsthesia produced by ether is equally complete and profound as that occasioned by chloroform.
- Third, that the inconveniences of ether, absent in chloroform, may be greatly lessened by a proper administration of the drug.
- Fourth, that the only contraindications for ether are its irritability, and its action upon the respiratory mucous membranes in cases where these are diseased or are in bad condition.

The mask used by Julliard for the administration of ether resembles the simple chloroform mask with the following modifications: the outer portion is covered with some impermeable cloth, either mackintosh or rubber, to prevent the rapid evaporation of the drug; it is also sufficiently large to permit of free respiration. The inhaler or mask is 15 centimetres long, 12 wide and 15 deep.

So much for Julliard's experiences and experiments. But he is not alone among Swiss and German surgeons in advocating the use of ether. Among German physicians in particular, who for a long time almost exclusively used chloroform as an anæsthetic, the gradual change of feeling is most marked. Garre, in the *Munch. Med. Wochenschrift*, gives the results of his experiments with both anæsthetics in a large number of cases, and heartily endorses the use of ether as a surgical anæsthetic in preference to chloroform. In 400 surgical cases in which ether was used as an anæsthetic, he observed that in those patients suffering from an organic lesion of the heart the drug was well borne and even exerted a beneficial action upon the affected organ; while in cases of respiratory troubles the irritative properties of ether rendered its use very objectionable. He concludes, therefore, that ether is preferable to chloroform in patients suffering from cardiac troubles; but on the contrary that chloroform is preferable to ether in cases of bronchial catarrh and similar affections. Garre found that anæsthesia occurs on an average in about four minutes, and that about 80cc. are required to maintain anæsthesia for a half an hour.

Dr. Frieter, in a recent issue of the *Deutsche Zeit. für Chirurgie*, also pleads the cause of ether as a general surgical anæsthetic; and Dr. Butter, in the *Archiv. für Klin. Chirurgie*, speaks most highly of ether as a substitute for chloroform in general surgery.

A great advantage of ether over chloroform, as recently pointed out by these investigators, is the rapidity with which patients recover from the effects of ether as compared with chloroform. Death from anæsthetization syncope, they also claim, will almost be unknown should ether be used instead of chloroform.

Thus an anæsthetic, the superior merits of which have long been recognized by the surgeons in this country, is now only gradually asserting its claims among our professional brethren abroad.—EDITORIAL, *Med. and Surg. Reporter*.

DISINFECTION OF THE HANDS.—Dr. H. A. Kelly, (*"American Journal of Obstetrics,"* December, 1891), after giving the details of a large number of experiments made by himself and his associates, gives the following conclusions as to the best method of disinfecting the hands :

Scrubbing the hands with especial attention to the nails, —not more than one millimetre in length,—for ten minutes in water, frequently changed, at about 104° F. Immersion of the hands in a solution of permanganate of potassium, made by adding an excess of the salt to boiling distilled water, until every part of the hands and lower forearms is stained a deep mahogany red or almost black color. They are then transferred at once to a saturated solution of oxalic acid until completely decolorized and of a healthy pink color. Washing off the oxalic acid in warm sterilized water.

By this simple process the hands are rendered more nearly absolutely aseptic than by any other known means.

The author has found that it is impossible to get rid of staphylococci by scrubbing the hands and nails from ten to twenty-five minutes with a sterilized brush, soap and water, temperature 104° F. The bichloride of mercury solutions as used, up to 1 : 500, are not germicidal, as supposed. Previous erroneous conclusions as to the efficiency of the bichloride are shown to be due to an inhibiting action which may persist at least twenty-four hours after the last use of the drug. Hydrogen peroxide and lysol (four per cent.) were tested and found wanting.

In the present state of our bacteriological knowledge as to the causes of inflammation and suppuration, we are bound to use every means in our power to avoid sowing any unnecessary germs in our wounds. Soap and water are, Dr. Kelly believes, the best disinfectants, if we use but one, for they remove all germs which will come away easily. The bichloride of mercury, although dangerous on wounds on account of its property of coagulating and causing necrosis of albuminous tissues, has the valuable property of inhibiting these germs with which it comes into contact. Permanganate of potassium and oxalic acid are harmless to the hands and are germicidal. Soap and water plus the permanganate of

potassium and oxalic acid are the only true germicides, and therefore the best disinfectants we possess to-day.—*Medical and Surgical Reporter*.

VERY RARE INDEED.—It is a rare thing for a human being to have three sets of teeth, and seldom that a baby is born with teeth; but a growth of teeth after death is, perhaps, the most odd of all such freaks. A case of this kind is reported from Cincinnati. Some time ago, the body of Mrs. Cathrine Davis was exhumed for removal. She died in 1852, aged thirty-nine years. She had been entirely destitute of teeth for several years before her death. The coffin, when opened revealed the features in a perfect state of preservation. But, beyond this, and much more to the astonishment of the assembled relatives, the half-opened mouth seemed almost smiling with a full and nearly perfect set of teeth of quite an inch in length.—*Exchange*.

What kind of soil is that which grows teeth an inch long in the mouths of dead people? No one has yet been able to produce them in the edentulous jaws of living persons, but here are all the minute particulars of a full set developed after death. What excuse has the editor of a grave professional journal, supposed to be published for educational purposes, for inserting such a roaring absurdity as that? Is he credulous enough to believe it to be a scientific fact, and if not, what reason can there be for the repeating of such a preposterous yarn?—*Dental Practitioner and Advertiser*.

DR. EUGENE S. TALBOT contends that "the constant extraction of the permanent teeth from one generation to another before the osseous system has been fully completed, is developing a race of individuals with small jaws." The time is rapidly approaching when extracting teeth, unless an absolute necessity, will be a statutory offence.

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ARTICLE I.

CHICAGO DENTAL SOCIETY.

Regular meeting July 12, 1892, Dr. J. W. Wassall, president, in the chair.

Dr. E. A. Royce read a paper entitled "Filling with Crystal Gold on the Surface of Amalgam."

The president called upon Dr. A. W. Freeman to open the discussion. Dr. Freeman said: I might say for once in this society you have taken me by surprise. I had no intimation that I should be called upon to open the discussion on this subject, as I have had very little experience with this method of making fillings. I therefore hardly know what to say. I feel that I cannot advise you as a good adviser. I should first like to see the specimens and then judge in regard to the work. I would say that I am always willing to try anything and everything that I think will save a tooth. I have always made it a practice of buying things at considerable expense oftentimes, and sometimes have found them of very little good. If we can judge a thing by its looks, I should think the specimen

we have here might be very good. I have put in perhaps ten or twenty of these fillings, and they have extended over a period of four or five years. I have never used all crystal gold. I have used Steurer's gold, but did not have first rate success with it, and I have not had perfect success with crystal gold, as I should judge our friend has by his specimens. I have taken cases where I could hardly make a gold filling and have veneered the surfaces of them, and they remained quite well. I have oftentimes mingled with that a little phosphate, and I am looking for results from those fillings. I cannot say that I have had enough experience to recommend the use of phosphate and amalgam highly; but I have had enough experience to recommend it as a fairly good thing. I believe that it is better than all phosphates from my limited experience with it. I am here to gain knowledge, and not to impart much on this subject.

Dr. J. G. Reid.—Mr. President, I do not think I have very much to say on this subject. I have patched a few gold filings with amalgam, or at least tried to, but have never had very much success with them. If I had taken the fillings out and filled the cavities anew, I perhaps would have been better off.

I attempted once to put in a gold and amalgam filling, and I got it about half-way in, then it all squeezed out and I quit. I went back to gold and tin, and finally filled it satisfactorily. I do not see that there is any particular advantage gained by using an amalgam filling over tin and gold. I believe a tin and gold filling combined will produce equally as good a result. I am not saying this from experience, because I am not experienced in the use of amalgam as Dr. Royce uses it. The amalgam filling I attempted to cover with foil. I expect was a miserable failure, but it would not have been a success anyway. It looks well. I think the crystal gold combined with amalgam will look better than the foil, and I use crystalloid gold entirely, and have for years, and have not used any-

thing else. I do not know whether crystalloid gold works with it nicely or not. It seems to me crystalloid gold would not work as well as Watt's crystal gold.

The specimen that has been passed around is very good indeed. All fillings look well out of the mouth. The only way to see them is in the mouth after they have been in two or three years. I should say it will expedite some fillings very materially, but not any more so than with tin and gold in combination. I have great confidence this combination and always have had. They fail sometimes just as any other filling, but that is not the question before the society. It is the question of amalgam and gold. I cannot speak on this subject from a practical standpoint. I have never put in one of these fillings in my life, and have never seen one put in as recommended by Dr. Royce—that is, the filling being started on soft amalgam.

Dr. C. P. Pruyn.—Unfortunately, I did not hear all the paper. I think I heard enough of it to get an idea of what the essayist intended to say. I have heard him talk on a previous occasion on this subject. I have tried in one or two instances to carry out the ideas that he has advanced, but I have not succeeded for some reason. I do not know just why I have been unsuccessful, but I have failed to make the gold work. I have failed to get the gold to thoroughly unite with the amalgam, and it became a mixed-up mass and did not work well in my inexperienced hands. The other method, the mechanical union of gold and amalgam, is one that has interested me considerably, but I think perhaps that is foreign to the subject of the paper. If it is not, I might talk a little on it; I am a thorough believer in gold and amalgam. I have practiced this method in many cases ever since I commenced to practice, putting amalgam in at one sitting, and at a subsequent occasion putting on gold. Where this is done there is a rapid oxidation of the amalgam, so that it becomes black like copper amalgam, and the gold remains

bright and clear, and if proper pains are taken the amalgam filling is quite as good as with gold. In the worst cases, where you use such a combination, you preserve the teeth better than with either one of the metals alone. This is my belief, founded on fifteen or eighteen years' experience. Doubtless many of you have seen cases that have been in my hands in former years; they have drifted into your hands. You may have seen these operations. If you have not, I would like to show them to you. Take the class of teeth spoken about so persistently a few years since by Drs. Chase and Palmer, below the average in quality, they could not stand well with metal alone. If you take this combination, you will have better results with it, I think, than with any other one method that can be used. The curse that was heaped upon amalgam ought not to have been upon amalgam *per se*, but upon the slovenly way in which it has been used. It is a good filling material for saving teeth. There is none better if it is used as it should be. If any of you have never filled a glass tube with amalgam, do it, with paper wrapped around it; then take the paper off and see the imperfections in the filling, unless more than ordinary care has been used. The practitioner will see air spaces where he thought the amalgam was in complete opposition. It takes no longer to fill a tooth with amalgam now than it did fifteen years ago. I have found that it needs time, it cannot be done as we were instructed to do it years ago. It cannot be done slovenly; we must use just as much care and thoroughness as with any other material, and I don't know but more. Then, we have with it a peculiar electrical condition of things that will destroy the microbes that produce decay. Amalgam does its best work at the cervical margin; gold does its poorest work at the cervical margin. Amalgam does its poorest work upon crown surfaces or angles; gold does its best work there. Take a large cavity in the distal surface of a second molar, fill it with amalgam, but with no attenuated edges. The cavity

must be prepared differently for gold. We must have good, sharp, square-cut walls; otherwise the attenuated walls would be clipped down and break off. We must have a beveled surface; there you use gold to advantage, using these two metals only. Where you use one at its strongest point and where it does its best work, you do your patient better service than if you attempt to use gold altogether. When I do work of this kind, I do not propose to put in such fillings for \$1.50 or \$3.00. If necessary, I charge \$10.00; I charge the patient for time. If you are doing your patients a service with amalgam that you could not do for them with gold, charge them for it just as though you were using gold.

Dr. J. H. Woolley.—In using a combination of amalgam and gold, do you fill with gold before the amalgam sets?

Dr. Pruyn.—I do not. I have never advocated that system. It does not seem to me that it is as practical, when done on mechanical and philosophical principles, as the other; still the essayist has shown from his experience that it is satisfactory in his hands.

Dr. A. E. Matteson.—I cannot say that I have had a great deal of experience with amalgam and gold as a filling material. I am firmly convinced that amalgam is a good thing, and that gold is a good thing. I have seen some very poor results from the use of amalgam and gold in combination from the best operators in the country. I have used amalgam and gold in combination frequently in repairing cervical margins, and I have had very good results following the use of them in that way. The great trouble with the use of amalgam is, in my experience, due to a lack of proper manipulation. I doubt if twenty-five per cent. of practitioners who are using amalgam use it as it ought to be used. They do not follow the directions. They have not the combination that was originally made, because they make amalgam and press out parts of the alloy with the mercury in excess. It is all wrong. If the

combination is correct it should be there, and the mercury should be in proportion, as it forms the mass. If there is too much mercury, add more alloy, and *vice versa*. I believe that a great majority of the failures are from a lack of manipulation. I have occasionally filled cavities (proximal) with the first half of amalgam, and gold for the remainder, for a number of years, allowing the amalgam to remain two or three days, then polishing and finishing it, then building over it with gold. I believe that there is chemical union after it has been allowed to set.

Dr. A. W. Harlan.—I listened very attentively and carefully to Dr. Royce's paper, and his ideas on the subject are very explicit. He says in a certain class of cases he mixes the amalgam dry and uses a matrix, packs the amalgam between the cavity wall and matrix nearly up to the edge of it and adds crystal gold until there is perfect union, then he fills the tooth with gold. That is very plain, and I believe I will try it. I have filled a great many teeth by introducing amalgam first, then cutting out the next day or at some other period a sufficient quantity and welding on with gold. I think it is justifiable practice, but not always. I tell the patient what I do it for. I have had very good results from operations of this kind, but to say that it should become a general practice would be far from what I mean. It is adapted for a certain class of cases where it is impossible to make a good, firm joint between the gold and tooth structure on account of the difficulty of reaching it with gold, so that it can be thoroughly packed, and the class of teeth where there is still greater difficulty in making a perfect edge out of the quality of the material. This other method, it seems to me, is preferable to the one I have practiced. I shall try it. Anything that will help to save a tooth is worthy of trial, and this seems to offer a new line for experiment. You do not need to make many of these fillings before you find out what the result will be, and if it is satisfactory it will become an accepted mode of practice.

Dr. R. B Tuller.—My first experience in trying the method of filling outlined by Dr. Royce was a little peculiar. I heard him describe his method on a previous occasion, and the first opportunity I had I tried it. I put in my amalgam at the cervical margin, filled up about one-third, and commenced packing in Watt's crystal gold, and as I was packing that in I was knocking out the amalgam, until I finally found the cavity was filled entirely with gold. That experience taught me that the matrix was an essential feature, and since that I have tried it in several cases where it has given me a great deal of satisfaction; but whether it will stand the test of time we will have to wait and see. It has been so satisfactory to me in a certain class of cases, as described by Dr. Royce, that I shall try it, I think, whenever such cases present; but I am an advocate of gold wherever I can use it and make a filling that will do what we aim to do—preserve the teeth. There are some cervical borders where the best and most skillful gold-workers in the profession could not, in my estimation, make as good a gold filling as could be done with amalgam.

Dr. Geo. J. Dennis.—I have had no experience in this line, but I have had the opportunity of seeing several of Dr. Royce's fillings that have been in four or five years, and all of them seem to preserve the teeth, with the exception that the walls of the teeth were frail; they were split off, leaving the gold and amalgam exposed from the crowns of the teeth to the cervical border. When I looked at the tooth, it seemed to me the wall had broken down, or the tooth had split off because of the expansion of the metal. Whether that was true or not I cannot positively say. There appeared to be a chemical union between the two metals, the gold and amalgam. The amalgam was pitted on its surface. The proximal surface was also pitted to a certain extent on the surface next to the tooth wall. The only objection I have to the use of amalgam is, that there is an unequal degree of expansion or shrinkage in

the case of the gold; that is, if very much mercury is used in the amalgam it takes up considerable gold. In the case in which the wall was split off the cervical border was perfectly preserved.

Dr. J. N. Crouse.—I have not had much experience with a combination of amalgam and gold, except as I have observed them in the mouths of patients, or where a gold filling had been put in and somebody put amalgam in and patched it up. I had a mouth of that kind to-day with eight or ten amalgam fillings combined, in different teeth. From the hands the cases were in, I know why amalgam was in the teeth. In one or two instances I have gouged out some portions of amalgam fillings and added gold rather than take out all the amalgam. It is a kind of operation that I should regret to see highly recommended to beginners or practitioners in middle life or old age. It tends, I think, to slovenliness. You can put an amalgam filling in a tooth where it is not half prepared and have it look well, and the chances are that if you operate with amalgam you will not properly prepare the cavity, whereas you would if you used gold. It has a tendency also, in my opinion, to take away the enthusiasm of the operator, that influence that every good operator must have and that fills him with encouragement, when he has done a good piece of work. When a dentist has performed a good operation he looks upon it with pleasure. One of the fascinations of operative dentistry is the beauty and perfection the operator sees after he has made a great effort. It is not only true of dentistry, but it is also true of everything in which a man succeeds.

What can be the advantages of amalgam and gold combined? It has been said that it has an additional influence in that it destroys microbes. That is a very indefinite proposition. If there is anything in a combination of mercury and tin, platinum and copper fillings, of amalgam and gold, I should think it would be used exclusively for the destruction of microbes. Personally I have very

little faith in such a theory or that kind of recommendation. The only good ground for the use of this combination is where the cavity passes so high up that it is impossible to get the dam above the cervical margin without inflicting a great amount of torture to the patient. You can pack amalgam quicker, and the very small amount of moisture that comes in contact with it and the cervical margin will not interfere with the operation. I can see how that can be done with credit and success. Generally speaking, if the practitioners of dentistry would practice the old and first method that had merit in it, which is packing soft cylinders of non cohesive gold, they would have an operation that is more perfect as to the safety of a tooth, consume very little more time, and would have that influence that shows when you are through that you have accomplished the object that you started out to accomplish. Show me any college that teaches its pupils how to pack soft cylinders of non-cohesive gold, and I would like to have a photograph of it. If there is one in this country that does it, I do not know where it is. It requires good judgment and self-collection to do it. You cannot pack non-cohesive cylinders and talk; you have got to have your mind on the work. If there is any better way of filling teeth than that, I want to see it.

If I understood the essayist correctly, one of his reasons why amalgam is better was that the packing of gold took away the excess of mercury, etc. I want to say that teeth can be saved in the way described by the author of the paper, but where are the advantages? Is it better than gold? I challenge that proposition to any kind of test that may be brought out. If you are going to use amalgam in connection with gold, I would recommend its use in large cervical cavities where decay has taken place beyond, and in order to fill such teeth with gold properly you have got a good deal to do. It would be justifiable to pack gold with amalgam in such places. I have performed this operation, I have gouged

out gold away up under the margin of the gum, and have patched it with amalgam or gutta-percha. I do not know which is the better of the two, but I should say gutta-percha.

Dr. C. F. Hartt.—I believe most of the gentlemen who have spoken to-night are away off. I have given up entirely the filling of large cavities with metal of any kind. A tooth of good structure should be filled with gold, and teeth below the average should be filled with cement. If we want something to hold the outside walls of the cavity together, fill the teeth with cement, then cut out say the sixteenth or eighteenth of an inch all around up to the enamel margin, and have a smooth, clean cut-margin wherever the enamel and cement come together. Fill that full with gold. You cannot get up there with cylinders, a spongy mass like that. You make a little retaining point or groove, you can fill it with cement, and you will be astonished how little gold is necessary to spread over the surface to protect the cement. It is a mistake to fill teeth with metal of any kind. Cement is the thing; then pack over it anything you want to that is durable.

Dr. E. A. Royce.—One of the first objections that I expected to hear has not been spoken of; that is the liability to mistake the color given by the amalgam at the gum margin for decay. This may be obviated by allowing the amalgam to extend farther down upon the lingual aspect of the tooth so it is plainly visible.

In regard to non-cohesive gold, I think that since I have been in Chicago, I have given more clinics to demonstrate its use than any other man in the city. I have at the present time under observation a number of cases where the compound proximate cavities of molars and bicuspid are built up entirely of non cohesive gold; the contour is such as to give fairly good points of contact, and the fillings are doing good service. I use the combination of tin and gold for a large class of cases, and am perfectly satisfied with it in its place.

Gold and amalgam should not take the place of gold. The best operators in the country are losing gold fillings every day; not entirely because of faulty manipulation, but in a great degree because of galvanic action. In the combination the amalgam will oxidize rapidly, stop the current, stop any minute openings, and in that way assist in saving the tooth. I do not attempt to save time by its use, but save the tooth that is below grade.

Crystal gold acts so nicely with mercury because it is manufactured by making a gold amalgam, and the mercury is then removed by acids, leaving the gold to be prepared for market.—*Dental Review*.

ARTICLE II.

PRODUCING CONTOUR FILLINGS.

BY R. OTTOLENGUI.

When attendant circumstances do not contra-indicate its use, gold undoubtedly will give the greatest satisfaction where any considerable portion of a tooth must be reproduced. I have known men who have claimed that they could make a permanent contour with *non-cohesive* gold. I do not doubt that such men do what they claim, but these individuals are rare. Therefore, I advise the beginner to depend on *cohesive* gold when his filling must extend beyond cavity-borders. Moreover, I would suggest that he obtain gold *as cohesive as it can be made*.

There are methods of manipulating gold, essential when contour is to be reproduced, which may not be so in ordinary cavities. For example, a filling might be made hollow, provided it touched the walls at all points. This would be a grand error in a contour filling. It has been stated by some that a large cavity may be well filled with crystal gold, the inner portion being only partly con-

densed, provided the outer third be made solid. However, this may be in ordinary work, it is not to be thought of in contouring. In placing a contour filling every piece of gold, from the first to the last, must be thoroughly condensed, and each pellet should display perfect cohesion. To take up these two points separately for a moment: Let us suppose an ordinary cavity with surrounding walls; it is half filled; the operator places a pellet, and mallets it less thoroughly than he has done its predecessors. He adds another, and continues the malleting: Of course, the force of the blows will further condense the under pellet. Even if it be not completely condensed, the fact that the shape of the remainder of the cavity is retentive without regard to that part already filled, makes it of no moment whether that one pellet is, or is not, thoroughly packed. With a contour filling it would be a hazardous oversight to leave a single pellet of gold insufficiently condensed. That point would be a weak spot. If heavy foil is being used, the rule is even more imperative. Every layer must be thoroughly condensed before the next is added, because with this kind of gold more than any other, an underlying layer is less likely to be condensed where another is superimposed before the malleting is completed. For a similar reason, however much need there may be to hurry, the dentist should never pick up two or three pieces of heavy foil at one time and attempt to condense them in that form; the ends, being irregularly arranged, will fold one over the other in such shapes as to offer the greatest possible resistance to the mallet, the result being improper condensation.

With the other point, relative to cohesion, the necessities for extreme caution, extending to every pellet, become evident along the same lines of argument. It is as bad for a filling to fracture because one layer did not cohere, as because there was a flaw from lack of solidity. As before, non-cohesion, or slight cohesion, may be overlooked in the body of a cavity having surrounding walls,

because what is placed above it will still be retained by the upper part of the cavity. It is otherwise with the contour filling. If only one layer, especially if it be of heavy foil, fails to cohere, all that which follows is but added to, and is not a part of, the filling. A fracture may be expected at any time.

It, therefore, follows that the size of the pellets, or strips of heavy foil, should not be increased near the end of the filling to hurry the work. Larger pieces will render solidity and cohesion both less liable. Above all things, large or even moderate-sized foot pluggers are to be avoided, though more permissible with the Bonwill mechanical, or the electrical mallet, than where a hand-mallet or hand-pressure is relied on. I wish to condemn the foot-plugger for this class of work, yet must speak with caution. Many men of skill use the foot-plugger with success, and with more rapidity than where another form was chosen. But these men select a foot-plugger which is narrow, and reaches a sharp point at one end. Thus, in one instrument is had the action of a foot-plugger, or of a point. What I am advising against is a broad, flat, and unusually long foot-plugger. This condenses so much surface at once that thorough cohesion is doubtfully obtained.

One more essential point: In packing any filling I make it my rule that, from the very initial pieces, the shape of the cavity must be such that I can use the mallet, without needing another tool to hold the gold steady. This is the rule; exceptions exist, but are very rare. *Applied to contour fillings, the rule must have absolutely no exceptions.* Every piece of gold as it is added must produce a filling, as far as the work has progressed, to dislodge which would require the engine drill. If at any time it is found that the filling will tip, or move in the slightest, the operator may as well remove his gold, and reshape his cavity. To emphasize this point, I will relate a case which occurred early in my career.

I was asked by a dentist, whose experience and skill were much respected by myself, to be at his office one afternoon to assist him in placing a large contour filling. He wished me to mallet and pass the gold. I did so. The tooth was a central incisor. The operator had prepared a cavity retentive in shape, merely because with a wheel-bur he had made an undercut, or groove, all around. This is exactly the plan to be followed in similar cases, where from abrasion the ends of teeth have been worn away, and it is desired to stop the destruction by offering masticating surfaces of gold. Then the filling is made *flush with the top of the tooth*, and will remain in place even though it must be held with another instrument all through the process of packing. (This, of course, need not be if the groove be properly shaped to retain the first pellet.) To so arrange a cavity, however, where, as in the case which I am citing, *about one quarter of the length of the tooth was to be restored*, was absurd. Thus I thought, but of course made no comment. The dentist began with a rather large pellet, and proceeded much as though he had been using *non-cohesive* gold. That is, he was mainly depending on wedging the pieces across from one groove to the other, using one instrument for condensing under the force of the mallet wielded by myself, and another to prevent the gold from rocking or moving. This was kept up till the whole cavity was filled flush, when of course it *appeared* solid. Then the work progressed rapidly, till the whole contour was completed, at the end of two hours' work. *In finishing this filling with a file, the dentist succeeded in straining it from its anchorage so that it could be slightly rocked.* He looked at me silently, and I refrained from speaking. He tipped it out, and, strange to say, proceeded to refill the cavity without change of plan. This time he succeeded in making the contour, and also in polishing it so that it *looked* really handsome. Moreover, it lasted as long as the lady lived, though I should record that *she died two weeks later.*

The essential features of a gold contour, therefore, are extreme solidity, extreme cohesion, and extreme immobility throughout and at every stage of the operation.—*Cosmos*.

ARTICLE III.

MICROBES, AND WHAT THEY ARE DOING.

BY D. V. BEACOCK, BROCKVILLE, ONT.

There are three conditions requisite to produce septic fermentation, viz., warmth, moisture and microbes.

Pathogenic fermentation produces ptomaines. An open wound is a constant invitation to floating germs; these soon generate pus.

Now, what is pus? Ask any number of physicians or dentists, and note how the answers will vary. One says dead matter is pus. Another replies, pus is dead blood. One tells us it may be defined as the result of a pathological state, pyogenia. Another, the viscous matter of a sore, a well-known product of inflammation. Webster defines pus as the matter of an ulcer.

Dr. Thomas, in his medical dictionary, defines pus as a bland, cream-like fluid found in abscesses or on the surface of sores,

Dr. Robert Hunter, in his dictionary, states the word is from the Greek and Latin, and in the Sanscrit is called *puya*, meaning to stink. He says it consists of pus corpuscles, liquor puris, and other histological particles, and may be healthy or laudable, sanious, ichorous or watery, purulent or serous, and may become cheesy and ultimately calcify.

In Cleveland's dictionary we find pus defined as matter produced by suppuration, a cream-like fluid, heavier than water.

Virchow calls pus dead or destroyed tissue.

Dr. Black's is undoubtedly the best definition ever given us. He defines pus as the liquefaction of the plastic exudate, by the operation of microbes, death of the ameboid cells, from the changed chemical character of their matrix. Here we see the exudate or matrix of these ameboid cells so changed that it fails to support them; they die, and the resultant mass is pus. These cells are called white blood corpuscles or leucocytes when they are in the blood, when they are outside in the tissues, they are called ameboid or wandering cells. They pass into the tissues from the blood vessels by a process called diapedesis, which means a oozing through without rupturing the walls of the vessels confining them. These cells are the white blood corpuscles, or more properly undeveloped connective tissue walls, and one of their functions in nature is to repair injuries. The plastic exudate thrown out during the process of inflammation, forms the matrix in which these ameboid cells develop. They are always found imbedded in it, and it is absolutely essential to their final development into living tissue.

By ameboid properties is meant not only the capability of free movement, but the possession of a power which enables a cell to take foreign particles into its interior.

An exposed pulp is in a similar condition to an open wound, and both must be kept entirely free from contact with pus producing germs. If once they enter this plastic exudate, it begins to liquefy, its chemical character is changed, it fails to support the ameboid cells, consequently they die; they are then known as pus corpuscles.

In open wounds this process always takes place on the outer surface; these ameboid or undeveloped connective tissue cells continue to pile up in the form of living granulations, some of them floating away in the liquefying mass that ought to have formed their matrix. In this way the matrix or exudate is kept constantly filled with ameboid cells, tending to develop into healthy granulations.

On the contrary, the liquefaction of some of this plastic exudate carries off some of these cells in the form of pus.

If the former exceed the latter process, healing by what is commonly known as first intention takes place; if on the other hand, the latter process exceeds the former, destruction of tissue is the result.

The accumulation of the waste products of the pyogenic fungi occurs in the pus of abscesses, rendering it unfit for the continued growth of the fungi which produced it. The operation of the fungus thus becomes limited to the fresh exudates thrown in from the wound. This is in turn limited as the wall of the wound become more solidly packed with ameboid cells, that is, living matter which is not so readily attacked. Microbes of pus formation cannot maintain themselves continuously in contact with living healthy tissue. This is a plain proof that vitality is one of the best germicides. All pus, no matter where found, whether upon the surface, in closed abscesses, or situated deep within the living tissues, is filled with micro-organisms.

The aim of the modern surgeon is to obtain the healing of wounds without suppuration. To this end he eliminates all micro-organisms, and uses dressings to prevent the access of germs to the wound. The intelligent dentist applies the same principle in his treatment of exposed pulps. Chronic and acute inflammations and abscesses of the mouth are due to the same pathological conditions which produce like results elsewhere in the body.

Modern aseptic dentistry consists in sterilization by germicides, dessication, etc. A fresh wound, if made aseptic, will heal by first intention; but if pyogenic germs are allowed to enter in any manner whatever, pus will be formed and trouble ensue, provided antiseptics are not carefully used.

In all those cases where the pulp chamber is opened for the first time, as in the removal of a living pulp, or a

pulp destroyed by the operator, we should never have an abscess occur, indeed it should be impossible except through direct infection.

An intelligent physician or dentist can now do almost anything he pleases, providing he conforms to aseptic and antiseptic methods.

In this way bacteriology may be said to have revolutionized the theory and practice of dentistry and medicine.

Aseptic treatment means to preserve a clean wound from septic infection. Antiseptic treatment simply means the prevention of further extension of existing trouble. The one may be said to prevent fire, the other to extinguish it. For a similar reason antiseptics are not disinfectants; they do not destroy micro-organisms, they only prevent or inhibit their growth. A germicide may be all three, antiseptic, germicide and disinfectant.

To the physiologist, bacteria are subjects of the greatest interest. Only think of the occult manner in which they produce the deadly and poisonous ptomaines, the mysterious character of fermentation, which is in numerous instances produced by them, lactic fermentation or the souring of milk, ammoniacal fermentation, vinous fermentation, the rotting of fish, meat and other nitrogenous substances: in fact, all putrefaction is the result of the ceaseless activity of these countless organisms.

When we investigate or carefully examine bacteria and their doings, from a pathological standpoint, we reach the very climax of wonder, wars, pestilence and famine. In fact, nature's most dire cataclysm sinks into insignificance compared with the destructive work of these pathogenic and infinitesimal organisms. It is fortunate for the human race that only a small proportion of bacteria, comparatively speaking, are pathogenic; the great majority are benign, their great work being for good in the world's economy. In acting the part of scavengers, they simply return the elements of organization back to their original

source with renewed activities for newer and higher combinations.

Every man among us lives by changes wrought in the chemical constituents of his environment. Each one of us is daily producing changes in quantities of chemical compounds known as food material, and constantly giving it back to the material world in chemical forms completely changed. The microbe is doing no more or no less.

The pathogenic germ is man's enemy, the benign germ is his friend. Bacteria are necessary as well as useful, for without them our farmers and gardeners would have little better than a desert or barren waste to till. Even our digestion is to a certain extent dependent on the family of benign germs, and millions occupy every portion of our bodies, no doubt for a beneficent purpose, although we may not realize it.

Paradoxical as the above may appear at first sight, it is nevertheless true that many of these germs are physiological. Pasteur isolated no less than seventeen different micro-organisms in the mouth; some of these dissolved albumen, caseine, and others converted starch into sugar. It therefore follows that the fermentative change they produce in food is a most important feature in digestion.

Even the very pus that these micro-organisms have been so persistent in elaborating has a beneficial purpose as a remedial process, such as granulation. etc., and frequently takes the place of far more morbid processes. It also affords a mechanical means of removing foreign bodies, *e. g.*, thorns, splinters, bits of broken glass, etc., from soft parts into which they may have been driven, and likewise in the formation of abscesses, may sometimes serve to eliminate morbid matter from the system.

All nature moves in a continuous change of cycles. Grass and herbs spring from the earth, air and water; herbivorous animals live and thrive on these, thus changing the constituents into other forms of food. These again are eaten by man and animals, and are again changed into

other forms to be again transformed into other material, making food for microbes and finally returned to the earth from which they all originated. Thus we see the whole animal world may be said to be preying on each other; even one set of microbes are destroyed and eaten by others (phagocytism), and these again by others, so that Swift's couplet is quite applicable :—

"The very fleas that do us tease,
Have lesser fleas to bite them,
And these again have lesser fleas
And so *ad infinitum*."

Out of the eight different processes by which the animal tissues are enabled to protect themselves against the action of bacteria, there are two which are very efficient, viz., phagocytism, and what may be denominated the bactericidal condition. Phagocytism, whether under normal or pathological conditions, is one of the manifestations of vis medicatrix nature. Under this condition, cellular activity prevents the development and increase of micro-organisms.

Under the latter a chemical condition is induced, which not only destroys microbes, reduces their nutrition, but retards their growth and multiplication.

It is by the activity of the ameboid cell or phagocyte that the gills and tails of tadpoles are removed during their metamorphosis.

Between the pyogenic microbe and the phagocyte there is a constant war even unto death.

Hess, to prove that the phagocyte cells were really aggressive in attacking pyogenic organisms, caused to be inserted, under the skin of a dog, a small capsule of glass with only a minute opening in one end. Into this capsule he had previously injected a quantity of Agar-Agar infected with staphylococci. The capsule, after a sufficient time, was removed from among the tissues. The phagocytes were found to be engorged with cocci.

You have all no doubt heard or read of Metchnikoff's

vivid description of an abscess. He likens specific inflammation to a warfare, in which the invading army is represented by micro-organisms, and the resisting force by leucocytes. Even in details the analogy was maintained. Notice of the arrival of the invaders was telegraphed, so to speak, by the vaso-motor nerves; the line of communication, the avenues of mobilization, were represented by the blood vessels. The aim of the invader is to secure the territory, to multiply rapidly, to live at the expense of the host, and to manufacture and circulate substances injurious to him. The aim of the resisting forces is to encircle the enemy, inclose him, digest him, and render him inert in battle. Many phagocytes die in the process, and if in large numbers, the heaps of the slain represent pus. An abscess therefore is a battle ground, densely packed with dead bodies.

As dentists we have to admit that pyogenic fungi are ever present in the mouth, consequently every wound we inflict is in peril of becoming infected by them.

Dr. Miller says that every tooth extracted which is not performed under antiseptic precautions, is nothing less than an inoculation, and whether the subject proves refractory or not will depend upon a variety of circumstances, such as the size of the wound, resistance of the parts, the character and number of bacteria entering the wound, the health and vitality of the patient.

Dr. Sternberg says he found in his own mouth at all times, sufficient microbes in the saliva to kill a rabbit in twenty-eight hours after being injected.

Microbes produce disease by manufacturing substances by their physiological processes of growth and development, which is injurious to health. Many are found to be quite harmless, others are dangerous in the highest degree.

Microbes may be carried through the circulation to a focus of inflammation, and there set up a suppurating process. For instance, if the ear of an animal is injected with pus forming microbes, a wound in the extremities of the body may become infected through the circulation.

It is quite evident that microbes may easily become the cause of many of our diseases. For instance, a wandering corpuscle from some suppurating tissue, getting entangled in some debilitated part of the system, begins its work of generation, and thus boils, carbuncles, swellings, and many other serious troubles result. These cells or corpuscles are not the cause, it must be remembered, until they have become demoralized by microbes or ptomaines.

It is still a matter of doubt as to what and how these ptomaines or waste products are produced. In many cases they are the excreta of microbes themselves, in other cases they are the result of the splitting up of more complex substance, or coalescing of simpler bodies by the disturbance of molecular state of the compounds caused by the growth of the micro-organism. Waste products of microbes are analogous to the waste products of the other forms of life. In a large proportion of cases they are active poisons. They are *always* poisonous to the form of life that produced them, that is, providing they exceed certain proportions. Strange as it may appear from the above, it will be seen that microbes actually manufacture their own germicides, as certain substances which they elaborate are the excreta of germs which are poisonous to them, just as the excreta of any animal is poison to it.

Prof. Hamilton asks: What is the immediate cause of putrefaction, and of septicemia, or blood poisoning, if bacteria are not? and states his belief that the cause is the resultant products of bacteria, known as ptomaines, which have been found to be crystalline alkaloids.

Dr. Black mentions that he has often passed a platinum suture wire, after making it red-hot, to disinfect it, into a foul root canal, and then into stiff cultivating media, four or five inches, and has seen the development of microbes along the track of the wire from one end to the other. Now, he asks, if these organisms can be carried into stiff gelatine in this way with a perfectly smooth

platinum wire, what may we expect from a barbed broach thrust through a foul root canal into the healthy tissue beyond?

Prof. Miller states, in looking over the literature of the subject, he had found fifty cases of death, resulting from abscesses caused by diseased teeth, or from dental operations performed without proper antiseptic precautions; and says, doubtless there have been hundreds of such cases, but the practitioner is not willing to have them made public. Serious results may also follow the wounding of the soft parts of the mouth, by the accidental slipping of germ laden burs, drills, excavators, etc., while working on the teeth. A young lady graduate had the misfortune to accidentally wound her finger while using the dental engine. The wound proved fatal.

You will, no doubt, be inclined to ask, What has all this to do with dentistry? I can only answer, very little, to those who think our profession consists in simply knowing how to manipulate the gas-bag, forceps and vulcanizer. On the other hand, it means a great deal to those who look upon dentistry as being a branch of the healing art. The mouth being the portal, or entrance to the system, it exerts a much greater influence over our general health than either patients or physicians are willing to admit. Only think for a moment, that the mouth may at any time become the focus of infection in many ways, and thus lay the foundation for some of the most dangerous diseases, and some of the worst of these may be brought about by the dentist's inability or carelessness. It behooves us as dentists to make ourselves well acquainted with the science of bacteriology, for the literature of medicine is *filled* with triumphal records of aseptic and antiseptic surgery.

Anyone who has occupied himself with this subject knows that the loss of appetite, nausea, and general ill-health are often brought about by improper attention to the mouth, causing a chronic state of putrefaction, the products being absorbed by the mucous membrane, with

serious results to the general health, and these patients finally restored to good health by simply putting the mouth in a normal condition.

Tuberculosis is an infectious disease that is readily conveyed from one person to another, and is caused by a micro-organism which attacks the lungs. Expectoration follows; the bacilli are in the sputta, these may lodge in a decayed tooth, on the gums, or in other parts of the oral cavity. Has it ever occurred to any of you that these micro-organisms may be conveyed from the mouth of a consumptive to the mouth of a healthy person, for it is said that when direct inoculation occurs by means of an instrument in the hands of a dentist or physician, it is almost certain to prove fatal?

I sometimes think we do not realize the fearful responsibility resting upon us as dentists in regard to this matter. Let me illustrate: We use the gum lancet, or extract a tooth in a mouth in which there are specific ulcers; the instruments are covered with infecting pus; we wipe or clean them off, or at least we think we do, and imagine that they are clean, while in reality they are in the best possible condition for inoculation; an innocent lady takes her seat in your beautifully upholstered chair, her gums are lanced, or a tooth extracted with this same instrument. What is likely to be the result, I ask, of such a slipshod performance? I will leave you to draw your own conclusions, and say nothing of the long train of *unfortunate consequences* that may follow, even to *succeeding generations*.

It cannot be too strongly impressed upon our minds that all instruments should be not merely cleansed, but thoroughly *sterilized* after use, or the next confiding patient may become inoculated.

We should ever remember that the law of asepsis rules every part of the great territory of antiseptic work, and in no department more than in dentistry.

If cleanliness is next to godliness anywhere, it is certainly doubly so in the mouth.—*Dominion Dent. Journal*.

ARTICLE IV.

DENTAL LAW OF THE DISTRICT OF COLUMBIA.

SECTION 1. *Be it enacted by the Senate and House of Representatives of the United States of America in Congress Assembled*, That it shall be unlawful for any person to practice dentistry in the District of Columbia, unless such person shall register with the Health Officer in compliance with the requirements hereinafter provided.

SEC. 2. That a board to carry out the purposes of this Act is hereby created, to be known as the Board of Dental Examiners, to consist of five reputable dentists resident of and for three years last before appointment actively engaged in the practice of dentistry in the District of Columbia, to be appointed by the Commissioners of said District for terms of five years, and till their successors are appointed: *Provided*, That the first five appointments shall be made for terms of one, two, three, four and five years, respectively. A majority of said board shall constitute a quorum. Vacancies occurring in said board shall be filled by appointment of eligible persons for unexpired terms.

SEC. 3. That it shall be the duty of the Board of Dental Examiners, first, to organize by electing one of their number President and one Secretary, to provide necessary books and blank forms, and publicly announce the requirements of this Act, and the time, place and means of complying with its provisions within thirty days from its passage; second, to promptly certify to the Health Officer for registration all who are engaged in the practice of dentistry in said district, at the time of passage of this Act, who apply therefor; third, to test the fitness and pass on the qualification of persons desiring to commence the practice of dentistry in said district after the passage of this

Act, and certify to the Health Officer for registration such as prove, under examination in theory and practice of dentistry, qualified in the judgment of the board to practice dentistry in said district; fourth, to report immediately in formation of any violation of this Act, and, annually, the transactions of the board to the Commissioners of the District of Columbia; *Provided*, That all graduates of dental colleges, which require a three years' course of study, shall be entitled to certificates on payment of the certification fee, and without examination as to their qualifications.

SEC. 4. That it shall be the duty of every person practicing dentistry in said district, at the time of the passage of this Act, to make application to said board, in form prescribed by said board, for certification, and present the certificates thus obtained for registration to the Health Officer within sixty days from the passage of this Act. Every such person so registering may continue to practice without incurring the penalties of this Act.

SEC. 5. That persons desiring to commence the practice of dentistry in said district after the passage of this Act, shall first obtain a certificate of qualification from the Board of Dental Examiners, granted under authority conferred upon said board by Section 3 of this Act, and present the same to the Health Officer for registration.

SEC. 6. That it shall be the duty of the Health Officer to register all persons presenting certificates from said board in a book kept for this purpose, and indorse upon each certificate the fact and date of such registrations.

SEC. 7. That certificates issued and indorsed under the provisions of this Act shall be evidence of the right of the person to whom granted to practice under this Act.

SEC. 8. That any one who shall practice, or attempt to practice dentistry in the said district, without having complied with the provisions of this Act, shall be deemed guilty of a misdemeanor, and, upon conviction thereof, shall be fined not less than fifty nor more than two hundred

dollars, and in default of payment of such fine shall be imprisoned not less than thirty nor more than ninety days, said fines, when collected, to be paid into the Treasury of the United States, to the credit of the District of Columbia; *Provided*, That nothing in this Act shall be construed to interfere with physicians in the discharge of their professional duties, nor with students pursuing a regular uninterrupted dental college course, or in *bona fide* papilage with a registered dentist.

SEC. 9. That to provide a fund to carry out and enforce the provision of this Act, the Board of Dental Examiners may charge such fees, not exceeding one dollar for each certificate and ten dollars for each examination, as will from time to time, in the opinion of said board, approved by said Commissioners, be necessary. From such fund all expenses shall be paid by the board; *Provided*, That such expenses shall in no case exceed the balance of receipts.

Approved June 6th, 1892.

ARTICLE V.

OPERATIVE DENTISTRY.

BY B. F. ARRINGTON, M. D., D. D. S., ASHEVILLE, N. C.

The first consideration in the care and preservation of children's teeth should be thorough and systematic cleanliness of the teeth. Inspection on the part of mother or nurse should be frequent. Tooth brushes suitable in size, shape and texture of bristles should be freely used several times daily, and always just before retiring at night so as to free the teeth of any impacted or accumulated substances. The mother or nurse should manipulate the brush as in their judgment may be best until children are

old enough to reason on the subject and fully comprehend the importance of the operation. All teeth back of the eye teeth should be carefully brushed on the cutting or grinding surface. With such care, the first set of temporary teeth would be retained with freedom from early and extreme decay and be preserved in a comparative state of comfort until discarded by natural process for the inception of permanent teeth. In the event of perceptible decay, with proper application of appropriate instruments and appliances, the defects can be easily and effectually removed and is far better for the teeth and more comfortable to patients of tender years than would be the operation of excavating and filling. If neglected until decay is too far advanced to be removed by means above advised, shape cavities to best advantage possible and fill with gutta-percha, and add to when necessary, or in large grinding surface cavities in molars or bicusps, cap gutta-percha with amalgam, and always with an amalgam possessing a large percentage of tin. Cavities in temporary teeth should never be filled with gold, it would be contrary to right, never justifiable would be a very great injustice to children and parents. To preserve the temporary teeth in fact for utility and proper development of maxillaries and space for permanent set of teeth should be the aim of every dentist regardless of any special material to be used or broad margins for profits. Young children should be dealt with in dental offices persuasively, gently and pleasantly, and under no circumstances should one be deceived by an operator.

In regard to extraction of temporary teeth, I will venture the assertion that if the above treatment could and should be successfully conducted, there would be but little or no necessity for extraction. If decay has progressed until there is pulp exposure and pain in consequence, then devitalize nerve and treat as for an adult under similar circumstances.

Arsenic is my favorite remedy for devitalizing nerve.

I have tried pretty much all remedies recommended and find nothing equal to or half so sure of good results as arsenic, the 30th or 40th of a grain is quite sufficient if rightly applied. My mode of application is to moisten a small pellet of cotton with creosote or campho-phenique held with pliers touch to arsenic for the quantity requisite and convey to cavity, carefully guarding against placing in direct contact with pulp, protect against moisture with beeswax or cotton and sandarach, with children the cotton and sandarach is preferable, let remain ten or twelve hours and remove, then after a lapse of six or eight days sufficient time for partial dissolution of pulp and nerve filaments, extirpate, and if successfully, without delay insert filling, first wiping out pulp chamber and roots with campho-phenique. Retain temporary teeth if possible until by natural process of waste they are of no further use. Of course there are some circumstances that will justify and require removal, but spare the forcep and elevator when possible to do so without detriment.

The six year molars, what of them? Should effort be made to preserve them or let them go without much consideration? The procedure as to preservation of the six year molars I consider altogether as circumstantial, thus, if the general contour and development of the maxillaries are delicate and contracted and the teeth large as is sometimes the case, requiring much space, and the delay is far advanced, I would say extract without delay that the next molar may move forward and fill space, thereby making more room for the wisdom teeth, which often prove troublesome, defective and worthless for want of room. If the maxillaries are well developed and promise ample space for all the teeth, then by all means save as best we can the six year molars. The six year molars and wisdom teeth are often as durable as any other teeth in the mouth, all things being equal. Regular systematic mastication on the six year molars as soon as erupted and continued, and the tooth brush rightly applied with per-

sistent regularity would insure usefulness and freedom from decay as certainly as any teeth in the mouth similarly treated, wisdom teeth likewise when not too much crowded. Any tooth or teeth to be healthy and preserved in a comparatively normal state, must be freely and regularly used, and sometimes, I might say often, the harder the substance masticated in reason, the better for health of teeth and gums.

Treating decay and filling teeth, I hold that any decay that can be successfully removed without detriment to the pulp, leaving the space smoothly polished and self cleansing, is wiser and better practice than to excavate and fill. Free separations and appropriate conservative treatment of defective surface is less expensive, less hurtful and harmful than filling. Decay around the necks of teeth, buccal and labial can be treated and the teeth better preserved by properly shaping, medicating and dressing, than by filling. I seldom ever fill that class of decay, having learned from experience long since that the use of chisels, finishing burs, corundum points, direct application of Nit. silver, creosote, Sul. acid, &c., followed with stick and polishing powders, will accomplish more for the comfort of my patients and preservations of their teeth than excavating burs, excavators and pluggers, with great saving of time and labor to operator and money to patients. Another very important consideration in favor of this line of practice, is the freedom from glaring exposure of gold as is often seen in mouths, and is always unsightly and often very objectionable, and if possible to be avoided, should never be tolerated in practice. I have examined the condition of teeth treated as above advised six or eight years after treatment and found them entirely satisfactory; no recurrence of decay and entire freedom from sensation as much so as any portion of crown in a normal state. Could a better result be desired, or obtained by excavating and filling with gold, the most popular material for such cavities, or any other material? I do not only question

it, but unhesitatingly assert without fear of contradiction based upon practice and experience, that so good a result could not be obtained. If the decay has advanced so far as to require excavating and filling, the question then arises as to material best suited, all things considered. Under some circumstances, gold is admissible and should be used, but in a large majority of cases guttapercha is preferable, it will serve a better purpose than any other material. I have patrons for whom I have inserted guttapercha fillings in labial and bucal cavities five and six years ago and the fillings are now in a good condition and bid fair to give satisfaction for years to come.

When I first commenced the use of guttapercha in such cavities, I feared the waste from friction in use of brush would be rapid and prove a hindrance to use of the article, or necessitate the operations of frequent adding to, but time and careful observation has convinced me to the contrary. The secret of success in the use of guttapercha consists in proper introduction and thorough condensation of material from base to surface. Never crowd or stuff a cavity with large pieces and never apply too much heat, better to apply heated instruments to material than material to heat. Every undercut and irregularity of cavity surface should be considered and worked properly, and special care to condensing at cervical section of cavities, especially in approximal cavities. No metal except cohesive tin can be so condensed into a cavity as to insure against leakage, as a good and reliable article of guttapercha, results justify the assertion, though greatly at variance with the expressed opinion of some of our most experienced and best operators. Facts established through practical experience and careful observation for results, and the results satisfactory will do to assert and defy contradiction. It is my honest judgment and conviction from experience that more teeth from early childhood to old age can be preserved in comfort and for usefulness with guttapercha than with gold singly or any other material now known.

to the profession, and it is only a question of time when guttapercha or some corresponding article will be in the lead of all material for filling cavities in teeth, and dentistry will not be on the decline, but the advance onward and upward.

When it was asserted and advocated a quarter of a century ago that rubber would take the place of gold as a base for artificial dentures, many protested and there went up a howl against it from Main to Mexico, and some gold advocates were so extreme in their prejudices and tied to their one idol gold, as to refuse to receive and impart instruction to dental students, unless they would pledge themselves not to use rubber in their practice. An extreme feature of contracted prejudice reduced to a point, censurable and pitiable. In the face of such opposition, rubber prevailed as was right it should. Thousands of the human family have been blessed with the privilege and use of artificial dentures on rubber-base at reasonable living rates, who must have suffered for want of them had the gold theory prevailed. The profession has rapidly advanced and gold quietly retired to the rear, to serve only in the future as emergency requires. So it may be, doubtless will be with gold as a filling material, in relation to guttapercha and similar preparations in operative dentistry short of the next quarter of a century. Humanity and true science freed of prejudice must and will prevail, and to the great credit of our profession.

Amalgams, especially those composed largely of tin serves a good purpose as a filling material and in a large majority of cavities will prove more durable than gold, and with the majority of persons in need of fillings as entirely satisfactory as gold, and for all classes would be as satisfactory, except as to appearance. Those who have through weakness, a fancy for display of gold in or on their teeth must be accommodated I suppose to some extent, possibly for a decade or so longer.

Some people are just so constituted, vain, weak and

wanting in judgment, they will insist upon the use of gold for filling, even if definitely informed, and positively certain the result would be unfavorable and teeth would not last so long as if filled with some other material. A weakness inexcusable, and must be regulated and corrected in course of time through education and a right advocacy of the right in all things pertaining to dentistry on the part of operators in the discharge of professional duties in their respective offices.

The weakness for display of gold has increased surprisingly during the past ten or fifteen years. Some people when consulting concerning treatment of their teeth when informed the chances are favorable for successful preservation by filling, will reason and argue thus: I will not have them filled now, they will probably last longer as they are without giving trouble, I will then have them crowned with gold. Any dentist who would sanction such a practice and not boldly advise against it is unworthy of the name of dentist. I am sorry to say I fear there are some such.

The growing disposition on the part of operators to display gold in the mouth (often as an advertisement) is an unfavorable and demoralizing feature in practice, and a crying shame upon a noble and useful profession. Gold is good and commendable as a filling material; it has served a good purpose and the use of it in filling teeth will be continued, and he or she who manipulates it skillfully and effectively deserves credit, but it is not the only material of merit for filling as some claim. It often serves a good purpose and under some circumstances can be advantageously used and in certain cases is superior to any other material, but to attempt to force its use in filling all cavities and under all circumstances is an absurdity and proof evident that those who so advocate are contracted in their ideas and limited in knowledge as to the best means of treating and preserving the natural teeth, and it is through such advocacy of gold fillings and ignorance of the more

conservative and broader scope of treatment requisite and practiced for the preservation of teeth that caused the wholesale extraction of teeth as now practiced and creates demand for artificial teeth. Less prejudice and more liberal minded conservatism in practice would be a wiser course, and the human family would thereby be profited. Only a short while ago, I read in a Dental Journal a declaration from an aged prominent member of the profession, and a professor in a dental college, that he had never filled a cavity with amalgam, inexcusable prejudice, and non-progressive, such a man should vacate position as teacher in a dental college and let some one less prejudiced and more progressive take his place. Conservatism and progress must be respected and encouraged. New remedies, material, instruments and appliances must be tested (rightly and thoroughly tested) and when found to possess true worth and can be used to advantage, give them a place as they merit, and in the interest of humanity and our profession, endorse and commend fearlessly and freely that the profession may advance and become truly progressive, plainly perceptible at the close of every decade, any action short of this will prove hurtful and a hindrance to professional elevation. Amalgam is daily growing in favor, prejudice abating with same, there is less abuse in the use of the article, in most of the colleges; students are instructed in the use of amalgam as in the use of gold as in the use of gold and other material, an encouraging feature, truly right and proper. A better class of work is being done and better results obtained than in former years. I am inclined to the opinion and will predict that twenty years hence, ninety per cent. of teeth filled in this country will be with plastic material, and a larger per cent. of teeth preserved than if gold alone or any one metal should be used. Time will determine the correctness of the prediction.

Under many circumstances gutta-percha must be combined with amalgam for successful preservation of teeth by

filling. In deep crown, approximal and bucal cavities, the base should be thoroughly covered with guttapercha and carefully condensed until cavity is one-fourth or one-third filled, a perfect safe-guard against injurious effects upon the nerve pulp from heat or cold. Then fill to completion with amalgam. Approximal cavities are the cavities of all cavities that require special care in preparation for filling, and manipulation of material in filling, and after all care and pains-taking defects will present sooner than in any other class of cavities, matters not with what filled. In the use of gold or amalgam it is admissable and advisable to pack the cervical section of cavity with guttapercha, a few years experience will satisfy anyone of the value of guttapercha thus applied. Whenever there is decay around an amalgam or gold filling at cervical section as is quite often seen around fillings as perfect as when first inserted, it is unwise and bad practice to repair with same material, guttapercha is preferable, it can be more easily applied and packed in cavity, and will better preserve against decay. Tin foil used in cylinder form, packed at cervical section of cavities to be filled with gold is good practice, preserves a tooth longer than if filled with all gold. A preparation of tin known as cohesive tin prepared by the S. S. White Dental Manufacturing Company, is an excellent article for filling children's teeth, it can be easily and rapidly introduced and condensed, makes a good water-tight filling and lasts very well, may be placed in close approximation to nerve pulp and cause no discomfort. It is an admirable adjunct to gold in filling deep cavities for adults. Fill cavity half or three-fourths full of cohesive tin and finish with gold, is far better for comfort and preservation of teeth than to fill with gold from base to completion. Many teeth can be filled and made useful for years with cement when nothing else could be used to advantage, and preserve so well the natural appearance of the teeth. I make free use of it and am pleased with results and so are my patrons. In the use of cements, it is all important to

preclude moisture during the operation of filling, and for an hour or so afterwards, which can be easily done by a right application of beeswax. All cements prove more durable in crown cavities than approximal, buccal or labial, and why? I would like to know. Experience teaches that the more open the approximal space the more durable the filling, not only cement fillings, but gold, amalgam and tin likewise.

Whenever approximal cavities are filled with metal, the space between the teeth should be left sufficiently open to admit of the free use of quill tooth picks, bristles of brush, linen tape, etc., but for floss silk never, no good but sometimes much harm is done by the too frequent and reckless use of floss silk, the use of it in dentistry should be discarded, no virtue in it, a fancy feature in practice, nothing more, nothing less.

On the subject of root filling there is great diversity of opinion and advocacy of sundry material and modes of introduction. I have tried much that has been recommended and my conviction based upon experience is that nothing recommended is equal to beeswax and cotton fiber, it can be more easily and quickly introduced, and more perfectly precludes the possibility of ingress of fluids to nerve canal than any other material, it is "non-conducting, non-irritant and non-destructible," three very important requisites in the operation of root filling.

Capping exposed nerves is a risky business and should not be ventured often, now and then there may be a success, but so seldom compared to failures, the risk is hardly worth taking. A nerve devitalized and removed from sentient extremity of root canal, admits of promise of comfort to patient and preservation of tooth for a great while, generally speaking, patients are satisfied with and appreciate such operations, but complain heavily and justly so if effort to save by capping proves a failure.

Operative dentistry, or in other words, proper care and treatment of the mouth, teeth and soft tissues from early

childhood to years of maturity, would in the course of time (a few decades) abate to a very considerable extent necessity for mechanical dentistry, and this is to be the ultimate destiny of the profession, all should hope for it and labor for it, especially in dental colleges.

All of dentistry (operative) does not consist in ability to make an ornamental display of gold in the teeth, the ability is commendable but the display is censurable and should be avoided when possible.

Decay should never advance so far as to admit of and require contour display fillings. Let us study and work to avoid that state of things. We should begin with children and let our treatment be preventive rather than restorative.

There is no justification for the wholesale extraction of teeth as is now practiced, the voice of the profession should be raised against it. It is practiced to an extent that is criminal in some cases, and should be considered a disgrace to the man or men who perpetrate the act. Nature should and does revolt at such a reckless and unauthorized sacrifice of natural organs of the human body. Let us go back to the beginning, teach and be taught, to treat and preserve if possible all the natural teeth.

The first thing now with a dental student when he enters college is to learn how to prepare cavities so as to display fillings specially to catch the public eye.

The first thought and desire should be to prepare for treatment and preservation of the teeth that they may never or very rarely require fillings that would be exposed to view, then by degrees advance to preparation of and filling cavities as something necessary as a last resort rather than extract, when this course is advised and practiced in dental colleges and private offices (as must and will be in course of time) we will be acting and living on a higher plane of professional excellence, our position and claims will be more respected and our services more appreciated.

The services of dentists should be as the services of practitioners of medicine, brought within the reach of all classes in communities; poverty and misfortune should be no barrier. For this to be accomplished, there must first be re-

form (greatly needed) in dental college education and office practice. There must be more conservative teaching and and eclectic practice, less radicalism in both teaching and practice and a truer cultivation of spirit and disposition to do for others what they can't do for themselves, and a willingness to "live and let alive" should prevail more largely with us. The practice of high charges (fifty and hundred dollar fillings) for notoriety is censurable, unauthorized and should be discouraged and discountenanced.

There is nothing to justify such charges, no such scale of difference as to manipulative ability between fair and accomplished operators in respective localities. It creates a false impression and is demoralizing in tendency.

At our annual meetings (Conventions and Associations) it is a practice (limited I am glad to say) with some dentists to exhibit and exchange cards containing high rates of charges as if it were any evidence of manipulative excellence and superior skill. It is of no good but hurtful in effect. Like other evils, it will have its day and will as surely pass away, only to be remembered with a blush of shame. A fifty or seventy five dollar filling is of no more value as a representative means of perpetrating usefulness of teeth than a filling for which three, five or ten dollars has been charged. Why then tolerate such an unauthorized rate of charges? The profession suffers by it as would any profession tolerating such a practice. Extortion has never permanently benefitted any profession or calling in life.

Equitable fair dealing should be our basis of action in all that we do for relief of human suffering and misfortune. We should by all means avoid making false impressions upon the minds of the young men of our profession. To teach them rightly, morally and nobly by example should be our aim, and by such means elevate our profession. Impress upon their minds the importance, dignity and influence of true manhood and virtue that they may scorn to do a little thing (professionally) for notoriety or pecuniary profit, and to base every action of professional life upon a high plane, striving to be excellent in the discharge and execution of every duty and every operation with every class of patients, to ignore pre-

judice of any type and under all circumstances to be ambitious for knowledge and capacity to administer effectively to the wants and needs of the unfortunate and afflicted, mitigate suffering and check the ravages of disease when possible, with freedom from desire for unmerited or unenviable notoriety through trick or strategy of any sort.

And now last but not of least importance, let all of us young and old come together as one individual brotherhood, working the interest of suffering humanity, consent to subdue and control prejudice to the extent that we may be willing as members of a rising, progressive profession in our efforts in operative dentistry, consent to be truly eclectic in theory and practice, and in treating for the preservation of the natural teeth, faithfully try all things favorably recommended for filling cavities from gold down or from gold up, and as honest liberal minded true men, praise and endorse cheerfully whatever gives us good results that our professional manhood may be strengthened, our relationship one to another become more harmonizing and pleasant, thereby cultivate in the estimation of the public and our respective patrons, a higher regard and truer appreciation of the noble profession we represent and love, and from which we all realize pleasure and many of us daily subsistence.—*Southern Dental Journal*

Editorial, Etc.

NECKLACE OF TEETH.—"The San Francisco Examiner" says: What the queue is to the Chinaman, what the tuft of hair in the middle of his head is to the American Indian, such to the Fiji Islander as giving him the pass to social distinction is the necklace he wears of teeth taken from his victims.

So says Dr. J. M. Whitney, of Honolulu, and he ought to know. For a few dollars he obtained such a necklace from a sailor who had been on a British man-of-war cruising among the Fiji Islands. Many traits of character and disposition are revealed on examining this necklace. In the first place, there are 288 teeth. As each tooth represents a victim the assumption is that this particular chief lived well and dined sumptuously.

Many of the teeth have not attained their full size. This indicates that the owners of the teeth were young and, of course, tender and juicy. All of which goes to show that the cannibal king was of a discriminating mind and knew good food when he saw it.

On the other hand, the presence of some very old-looking teeth augurs that sometimes times were hard and the poor cannibal had to put up with what he could get. This would encourage the virtues of fortitude and self denial.

EIGHTEEN hundred pounds of gold goes into people's teeth every year, put there by dentists.

Monthly Summary.

VULCANIZING.—Dr. Geo. B. Snow says in a recent letter :—"I find black rubber a rather treacherous material to work by the directions I have given. I have had what for lack of a better name I shall call 'blow holes,' when I am certain the case was well packed. I finally hit upon the plan of not fully closing the flask—interposing strips of thin metal of a thickness I thought sufficient to compensate for shrinkage. As the rubber expands in heating to 320, some of it is forced into the gateways, and a constant pressure is thus exerted upon the contents of the flask until vulcanization and its consequent shrinkage begins. At the proper time, the vulcanizer is opened and the pieces withdrawn, and the case re-heated to allow the flask to close. This puts the rubber into the same conditions as in the usual practice, until after vulcanization is nearly completed."

A pamphlet on the "new process" of vulcanizing, embodying the above in working detail, may be looked for in the near future.—*Odontographic Journal*.

GUM LANCING AN IMPORTANT THERAPEUTICAL MEASURE.—Clinically, I am absolutely sure that I have seen convulsions, sick stomach, great restlessness, fever, and various other functional disturbances in young children, immediately cured by the use of the gum lancet, after the failure of various other well directed measures for relief. Theoretically, I am in accord with Dr. Kirk, in believing that Dr. Forchheimer absolutely misses the point of the matter, by his failure to understand that the good achieved is not due to the local blood letting or to the relief of the inflammation of the gum, but to the removal of the backward pressure upon an extraordinary sensitive and, at such times, congested tooth pulp. As was long ago pointed out by Dr. J. W. White, at the period of eruption the roots of the teeth are incomplete.

"Instead of the conical termination and minute foramen, which characterize a perfected tooth, the aperture is nearly as large as the tooth itself, and thus when the sensitive pulp, composed of connective tissue, blood vessels, and nerves, is in a condition of irritation because of the morbid activity of the process of dentition—augmented vascular and nervous action—there may be produced a hyperemia sufficient, possibly, to cause the protrusion of a part of the mass from the incomplete aperture of the root, giving abundant cause for extreme constitutional disturbance."

I have myself seen a seemingly incurable epilepsy in an adult permanently cured by the removal of a persistent milk or first dentine tooth. Amaurosis and various other conditions in the adult, are well known to be the result of irritation of the trigeminal nerve by faulty teeth. How much more evil is to be expected from teeth irritation in the child!

In conclusion, I reaffirm that whatever the theory in the matter may be, I am positive that gum lancing is the most important therapeutic measure. It is essential, however, that it should be thorough, and with the object of dividing the dense tissues that bind down the teeth.—WOOD (H. C.), *University Medical Magazine*.

NEW METHOD OF ARTIFICIAL RESPIRATION.—M. Raborde reported two cases of apparent drowning in which he had excited the respiratory action by employing forcible rhythmic traction upon the tongue, backwards and forwards. A spoon or the finger is used to keep the mouth open and fix the base of the tongue. At the same time the thorax is enveloped in cloths wrung out of hot water, care being taken not to scald it. This idea was suggested to the author by laboratory experiments upon animals asphyxiated by chloroform, he having noticed that when the tongue was pulled out to straighten the air-passages before commencing artificial respiration, respiratory efforts were frequently excited. This led him to investigate, with the result that he discovered this method which he believes is superior to all others. "In all

cases—and this is my conclusion—never despair, no matter how probable death may appear.” is the advice with which he closes the communication which was made to the Academie de Medecine de Paris.—*Le Bulletin Medical*, July 6, '92.

SIMPLE TESTS FOR IMPURITIES IN WATER.—The following methods of determining the presence of impurities in water are given by Walling: 1. For organic matter put a little of the sample into a beaker, add two or three drops of dilute sulphuric acid and color distinctly with a solution of permanganate of potassium. If much organic matter is present the color of permanganate becomes discharged almost immediately; if less or very little, it takes longer to decolorize. If the color has not changed in twenty-five or thirty minutes it is safe to assume that organic matter was not present. This is a tolerably test 2. For nitrites, a little sulphuric acid added to the water forms nitrous acid if nitrites are present, which is easily detected by its power of liberating iodine from iodide of potassium. A little starch paste is mixed with a small quantity of a solution of potassium iodide, and the mixture added to the suspected water containing the sulphuric acid. If nitrites are present the nitrous acid formed liberates the iodine from the iodide, which turns blue with starch. This indirect method is a ready means for detecting the nitrites if present in not too small a quantity. 3. Nitrates are detected by converting into nitric acid, which turns morphia red. A portion of water is evaporated to dryness, the residue treated with a drop of strong sulphuric acid (which makes nitric acid of the nitrate) and a portion of morphia added. If nitrate is present the morphia gives red color. 4. For ammonia, Nessler's reagent is by far the best test. It may be made by dissolving eighteen grains of oxide of potassium in a little water, adding solution of mercuric chloride until the red iodide of mercury first formed redissolves upon agitation. To this is added a solution of fifty grains caustic potassa and distilled water to make eight ounces. This reagent will detect

0.00375 of a grain in a pint of water by giving a yellow color. A reddish color or precipitate forms with larger quantities of ammonia. 5. Albuminoid matter requires a more elaborated proceeding for its detection. If all of the above were found it is hardly necessary to go to the trouble of looking for albuminoids; the water would be unwholesome even if they were not present.—*Pharmaceutical Era*.

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COCAINE.—M. Bignon (*Bull. de Therap.*) formulates the results of his experimental researches as follows: (1) Cocaine parts with its valuable anæsthetic properties in a decidedly acid solution. (2) In such solutions its power as an anæsthetic is not destroyed, but becomes latent. (3) The anæsthetic property is fully restored by simply neutralizing the acid. (4) All the mineral and organic acids used in the experiments operated in the above manner. (5) The anæsthetic energy of cocaine attains its maximum when, all its acid having been neutralized, the alkaloid is held in suspension by a slightly alkaline liquid. This preparation the author calls milk of cocaine. (6) Milk of cocaine is obtained by precipitating the hydrochlorate or other salt of cocaine by a slight excess of carbonate of soda. The bicarbonate does not act so well. (7) Most of the cocaine salts, especially the hydrochlorate, retain an appreciable quantity of acid; hence their solutions do not possess the full anæsthetic potency of the alkaloid; i. e., a portion of the same remains latent. (8) The anæsthetic power of cocaine salts varies greatly in different cases. Some crystallized hydrochlorates, though perfectly pure, are so acid that 10 centigrams, simply dissolved in water, are no more efficacious than half the quantity when neutralized and made into milk of cocaine. (9) The surgeon's first care, therefore, before using a solution of any cocaine salt, should be to assure himself of its neutrality; this can only be obtained at a sacrifice of limpidity; it is accompanied by some degree of opalescence. (10) The difference in the quantities required for production of anæsthesia is in most cases explainable by the difference in the acidity of the solutions employed.

(11) The effect of subcutaneous injections of milk of cocaine on the human subject has yet to be ascertained. Experiments on dogs have given encouraging results in this direction, but the author has not succeeded so far in localizing the action. Milk of cocaine should always be prepared extemporaneously; as by keeping, the alkaloid is thrown down from the solutions, and much of their efficacy is lost.—*Medical and Surg. Reporter.*

THE KEELEY CURE.—Dr. Keeley has taken great pains to keep his remedies a secret, but they have been secured and analyzed by competent chemists, and are now well known. The treatment consists in the use hypodermically four times a day of a solution which shows an analysis of:

R	Strychnia sulph.	-	-	gr. ʒ.
	Atropia,	-	-	gr. ʒ.
	Acid boracic,	-	-	gr. xv.
	Aq. dest,	-	-	oz. iv.

The formula of the tonic taken by the mouth is:

R	Ammon muriate,	-	-	gr. j.
	AAloin,	-	-	gr. ij.
	Tr. cinch comp.,	-	-	oz. iij.
	Aq. dest,	-	-	oz. j.

M. S. Teaspoonful every two hours while awake.

During the initial treatment—for the first one, two or three days—much heavier injections of atropia are given, in combination with morphine. Any physician will know at a glance that the quantity of strychnine used is so minute, considering its relative potency, that it can have little effect in modifying the action of the atropia. The tonics support, to a degree, but they, too, have little influence in controlling the symptoms produced by that powerful drug.—*Times and Register.*

SALOPHEIN.—Siebel (*Therap. Monatshefte*, January, '92) says that salol was introduced on account of some of the unpleasant symptoms produced by the salicylates. Salol, however, has not been found harmless, and is contraindicated in cases of renal disease. Salophen is a combination of salicylic acid with acetylparamidophenoether.

It is split up into these two constituents by pancreatic ferment, but not by the acid gastric juice. Any of the drug not so decomposed has been found to be excreted with the feces. Salophen hinders decomposition when in such quantity as to provide sufficient salicylic acid. It is without taste or smell, and has very feeble toxic properties. At most, symptoms of salicylic acid intoxication would be produced, for the other constituent is without poisonous qualities. Dr. Guttman has spoken favorably of the clinical properties of salophein.—*British Medical Journal*.

VALLEY TAN.—With the single exception of the American Indian, it is said there has never existed any people so low in intelligence that they have not devised some means of obtaining alcohol in sufficient strength to produce intoxication. Probably there is no product that is so universal among mankind. Even the inhabitants of the frozen North get alcohol by distilling the products of the arctic fir-trees. It is a singular fact that the American Indian, who never of himself obtained alcohol by any process of distillation, has the most ungovernable appetite for it. There never was a native Indian who would not get drunk if the opportunity offered.

The Mormons of Utah never allow the sale of alcohol among themselves when they are masters of the situation. Yet their religion does not conquer their appetites, for they have an illicit form of it called Valley Tan, which is indigenous to Mormondom. It is said to have all the characteristics of a distillation from sage brush. It looks bitter, smells loud, and tastes yellow, but it gets there just the same—*Dominion Dent. Journal*.

CLEAN INSTRUMENTS.—Dr. George S. Allen, of New York, in the "International Dental Journal," recommends the use of a one to one thousand solution of bichloride of mercury in rosewater, as an elegant and efficient disinfecting fluid for instruments. Contrary to the common opinion that steel instruments suffer from the use of any solution of the bichloride, he finds that they remain perfectly unaffected after being dipped in it hundreds of times. By the use of rosewater the bug-poison taste of the simple solution is entirely supplanted by an agreeable rose-flavored one. As the plain bichloride decomposes, he advises the preparation of a one per cent. solution from the tartaric sublimate tablets, and the addition of nine parts of rosewater to one of the solution when it is wanted for the disinfection of instruments or for use in the mouth.—*Dominion Dent. Journal.*

DR. BARRETT says that a bur is a very dangerous instrument to introduce into a pulp chamber. Where it is necessary to enlarge the opening into a canal, the excavator, he thinks, is the only safe thing, because we know what progress has been made with it. The bur, he contends, buries itself in its own *debris*, so that its exact position cannot be definitely determined.—*Items of Interest.*

COLD IN THE HEAD.—For cold in the head while in the acute congestive stage, there is no better remedy than gelsemium. One good large dose, say ten minims of the fluid extract, taken upon going to bed will effectually dispose of this troublesome and uncomfortable affection. One dose is usually sufficient.—*Med. and Surg. Reporter.*

A FATAL CURIOSITY.—A weaver in Accrington, England, put a turpentine stupe over his abdomen for the relief of a severe colic. It did not seem to burn as much as it ought, and he struck a match to see what was the reason. The match ignited the turpentine and the man was burned to death.—*Montreal Med. Journal.*

A PROCESS FOR SOLDERING GLASS AND PORCELAIN WITH METALS.—Mr. Caillietet has recently made known to the *Societe de Physique* a process of soldering glass and porcelain with metals. Mechanists, physicists and chemists will appreciate the practical importance of this process, which permits of adapting any metallic object (cock, tube, conducting wire, etc.,) to apparatus in such a way as to prevent any leakage, even under high pressure.

The process is very simple. The portion of the tube that is to be soldered is first covered with a thin layer of platinum. This deposit is obtained by covering the slightly heated glass by means of a brush, with very neutral chloride of platinum, mixed with essential oil of chamomile. The oil is slowly evaporated, and when the white and odoriferous vapors cease to be given off, the temperature is raised to a red heat. The platinum is then reduced and covers the glass tube with a bright layer of metal. On fixing the tube thus metallized, and placed in a bath of sulphate of copper, to the negative pole of a battery of suitable energy, there is deposited on the platinum a ring of copper, malleable and adhesive.

In this state the glass tube covered with copper can be treated like a genuine metallic tube, and be soldered by means of tin to iron, platinum, and all metals that can be united with tin solder.

The resistance and strength of soldering are very great. Mr. Caillietet has found that a tube of his apparatus for liquefying gases, the upper extremity of which has been closed by means of an ajutage thus soldered, resists pressure of more than 300 atmospheres. The tube, instead of being platinized, may be silverized by raising the glass covered with nitrate of silver up to a heat bordering on red. The silver thus reduced adheres perfectly to the glass, but numerous experiments have caused platinizing to be generally preferred to silverizing.—*La Nature*.

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ARTICLE I.

A CASE OF PYORRHOEA ALVEOLARIS.

BY DR. J. E. CRAVENS.

Read at the American Dental Association, 1892.

The patient was a man of fifty years, robust and apparently in good health. The gums generally were red and angry-looking, bleeding easily and freely; expressed considerable pus from about the anterior eight teeth of each jaw, the festoons between which were swollen and of a violet color; "pockets" on the approximal faces of the pus-discharging cases. Treatment was begun on the 18th of July with the removal of the incrustations and trimming of the margins affected as far as possible, the "pockets" being washed out with hot water and carefully treated with dilute sulphuric acid (1-10). Pulverized sulphur, as a dentifrice, morning and night, was directed, and the use of soap and other alkalis in the mouth prohibited. After three days' daily treatment, but little improvement being manifest, the dilute sulphuric acid was substituted by a 10

per cent. solution of nitrate of silver, the washing with hot water being continued. No caustic action and no pain from the lunar caustic solution was observed. The next day no pus could be expressed, except from between the lower centrals and right inferior cuspid, and from between and around the right superior cuspid and lateral, which were the seats of the deeper pockets. Again washed out and treated with nitrate of silver. On the 25th congestion was gone, except slight violet tint over roots of inferior centrals, right inferior cuspid, and right superior lateral incisor, with only slight evidences of pus from these localities. Treated as before. On the 26th no pus except a minute quantity from one side of the right superior lateral incisor. Gum completely free from swelling. Again washed and treated. The next day no pus at any point; gums apparently healthy, and patient reported entire comfort. Again washed and treated as before. On the 29th no pus; "pockets" evidently filling up by adhesions. Again washed out with hot water, and treated with the nitrate of silver solution.

The writer noted that the nitrate of silver caused a slight brownish discoloration about the necks of the teeth treated, but it exhibited no caustic action whatever. He thought its astringent and antiseptic effects were emphasized by the thorough washing out of the "pockets" with hot water at each sitting, and he believed that the preliminary use of dilute sulphuric acid aided in removing small particles of calcareous matter from the "pockets" and stimulated granulation. The case appeared to be cured, and in an incredibly short time, though it would be under observation for some weeks.

Dr. W. C. Barrett, Buffalo, N. Y.: No disease within the province of dentistry calls for so great thought and reflection as pyorrhœa alveolaris. Its etiology has never been fully comprehended, or at least expressed. Remedies have been prescribed which are always successful in papers, and in practice almost always failures. At least that has

been his experience, and also of those with whom he has talked. If pyorrhœa is a constitutional disorder, then mere local treatment is of no value. If it is merely a local disease, then local treatment should suffice for all ordinary cases. He has never found that local treatment would suffice in every case. In many cases topical remedies merely palliated the difficulty. What is wanted is something to eradicate the disease. By the exhibition of remedies he has been able to check the disease, but in six months or a year the patient will return with a new manifestation of it. That has been the almost invariable rule in the cases of that kind which he has attempted to treat. The remedy proposed in the paper is a cauterant. He knows of no therapeutic measure that seems to have value except to cauterize the tissues affected. Dr. Cravens' statement would indicate that the case described was a local manifestation and nothing else. It was only treated last month. Will it not return in three or six months? If it is simply a local manifestation of a constitutional disorder, there will be a return; but it would be interesting to know whether it has only been checked for the time being, and that is the speaker's opinion. He would like to hear from others, whether in such cases there is not a return of the disease with exaggerated force and virulency.

Dr. M. L. Rhein, New York, N. Y., would concede some of the points made by the last speaker, and others he would not agree to. From hearing the paper read he should have thought it was not a case of pure pyorrhœa, as distinguished from the false variety which results from bad hygienic management. One fault in these cases was often bad diagnosis. At the start it should be settled always whether the patient is in bad or good health, and this can only be done by thorough examination by a physician. Assuming that the patient was in health, he believes there was no pyorrhœa in this case. As to the etiology of pyorrhœa alveolaris, it is pretty fully established in his mind, and in the minds of many other prac-

tioners, that the disease recognized as pyorrhœa alveolaris is either a sequence of some constitutional disorder, or an indication that constitutional disorder is present at the time; in other words, there is faulty nutrition. If the constitutional disease is curable, he can give a favorable prognosis of the pyorrhœa; if it is a sequence that is curable, he can give a more favorable prognosis. One special point should be to distinguish between the common form of what is sometimes called pyorrhœa, resulting from a badly kept mouth, and that which is a sequence of a constitutional disturbance. If we cannot determine this by ourselves, we can by consultation with a physician as to the condition of the patient. Many persons with this trouble have passed through his hands that never have been cured, and to whom he never promised a cure because he knew the case was hopeless, as where there was tuberculosis. Where he finds this in such grave form that the physician knows it to be incurable, it is useless to give a favorable prognosis.

Dr. W. H. Morgan, Nashville, Tenn.: As to the etiology of pyorrhœa alveolaris, observation more than any other theory had convinced him that the disease was constitutional, and in a large majority of cases inherited. Every case can be cured; just remove the teeth, and nature will do the rest. He did not know that it was ever cured except by the removal of the teeth.

Dr. A. W. Harlan, Chicago, Ill.: The subject under discussion is the treatment of a single case, and not the etiology of the disorder or a multitude of remedies for it. There is no objection to the use of dilute sulphuric acid as a preliminary step, because it contains 13 per cent. of the acid to 87 per cent. of water, and is then diluted ten times, so that when brought in contact with the soft tissues it does no damage. Nitrate of silver is an excellent remedy, and has been used for many years, but not in so concentrated a form as described by Dr. Cravens. It would be a powerful astringent, and the reason why it

would check the flow of pus and close the "pockets" would be because of its astringent and stimulating effects. To say that the case was cured after eleven days' treatment is hardly credible, because it would be almost impossible, if one-half the depth of the roots were involved, for the tissue to be reproduced in that time. The use of hot water is an excellent idea; in a great many cases better than many other agents which are used. Dentists fail to utilize hot water as a therapeutic agent as much as they should, and Dr. Cravens has made a good point in calling attention to it for producing an effect on the gums. The speaker dilutes sulphuric acid with cinnamon water because he believes he gets a better effect than when he uses ordinary hydrant water.

Dr. Cravens: Dr. Barrett misunderstood the statement of the paper as to the effect of nitrate of silver solution. He had stated in the paper that he could observe no caustic effect. He could not agree with Dr. Rhein as to the constitutional origin of the trouble. Dr. Evans, of Paris, has seen so many cases of the disease associated with affections of the kidneys that he thought it was likely to be recognized as a manifestation of kidney trouble. It is also recognized on the other side of the ocean as a manifestation of gout. As to whether the case described in the paper was cured, he had simply expressed his opinion that it was cured.—*Cosmos*.

ARTICLE II.

THE FIRST MOLAR.

If the first molar is extracted before the second molar has erupted, we find the space closing up sooner, and to all appearances there has not been any retrograde movement on the anterior teeth. But upon examination of the bite and jaws, we find a change and a change not entirely at the expense of the jaw posterior to the lesion.

It has been taught in our colleges and journals that we must expect the second molar to occupy the space left vacant, and our natural conclusion has been in harmony with these teachings.

It is contrary to all scientific reasoning to expect such a result where extraction takes place at an age when the jaws are so yielding to the forces brought to bear upon them.

How often do we find a first molar moving forward to occupy the space left vacant after extracting the second bicuspid?

I have never observed one such instance. Is it not just as lame an argument to advance as that of a second molar moving forward to occupy the first molar's space?

The models I have passed around are casts of my own mouth showing the arrangement of teeth and changes taken place. You will readily see the absence of the first molars in both upper and lower jaws. The upper were extracted at about the tenth or eleventh year, and the lower were left in the jaw until exfoliated, which was completed at the fifteenth or sixteenth year. So the upper were lost before and the latter several years after the eruption of the second molars, bringing about the change presented.

We have in this case a decided shortening of the bite which is shown by the position of the occluding teeth, instead of an interlocking of the canines and bicuspid which was the normal occlusion prior to the extraction, the superior canines and incisors are striking directly upon the incisive surfaces of the eight anterior lower teeth, proving conclusively a determined shortening of the bite. There is also a loss of the use of six bicuspids, the four superior and two inferior. I might say here that in all cases the lower jaw is not interfered with to near the extent of the upper after extraction, owing no doubt to the fact that the inferior maxillary bone is ossified earlier in life and is of a stronger mould and texture offering more resistance.

I maintain that the superior maxillary in this case has been shortened to the extent of the width of the missing tooth extracted, not saying anything about the constriction in the width of the jaw.

The second inferior molar having erupted earlier than the superior, which is true in the majority of cases, gives it more prestige, having a firmer union with the jaw controlling the movement of its antagonist. The result you observe holding the superior second molar in nearly its normal position, thereby prohibiting an interior movement, but not a rotary movement. The forces brought to bear at this early age upon the superior teeth anterior to the first molar might be regretted as insignificant.

We observe in our every day practice that the protrusions of the superior or inferior canines if let alone, will in the course of a short time be adjusted to the arch and antagonistic teeth. The only force brought to bear is the weight of and contractions of the obicularis oris muscle, with the assistance of the muscles of expression and mastication. If the bones and process is so yielding at the time of the eruption of the canines, why should not the jaw be more so during the eruption of the second molars two years previous?

There is no doubt that if such changes as above mentioned come about at the age of twelve that the jaws have not become fully developed, and adhering to the law governing repair, the destruction is always the greatest in the direction of the least resistance. We have a retrograde movement in every case of early extraction of the sixth year molar. In the superior maxillary the molar eminence adds its marked features to the face, its consequent absorption, its dire effect upon the stronger expression. In every case of early extraction there is an entire loss of this protuberance, and the muscles and surfaces over it become shortened and flattened with constriction of the face in its vicinity. There is a depression at the alæ-nasi, and a sunken condition of the bones which occasionally

extends to the floor of the orbit. In the face of all the abnormalities produced we have our journals full of this or that theory relative to the time when this tooth should be extracted. One writer claims the eight year, another the tenth, and another the eleventh or twelfth, and all for what purpose? To bring about a better arrangement and condition of the tenth and for the benefit of humanity in general.

I am safe in making the assertion that nature has not produced as many irregularities as the early extraction of the six year molar has occasioned. Does extracting this tooth at an early age preclude all possibility of an overcrowded condition? Can we foretell the size, development and exact arrangement of the teeth and jaws far into the future? If such prophetic knowledge is possessed by a few, the whole profession should know it. Nature's plan of eruption is a most harmonious one. When the first molar is erupted it acts as an anchor or foundation to the arch, always in the proper place competently adapted for the purpose intended, and in the course of time the second molar erupts, reinforcing as it were, in accordance with the eternal fitness of things.

Now, are we as a scientific profession going to improve upon nature's plan by removing the foundation and dictate our plan of constructing a human jaw? We should have not only one object in view from extracting, giving room for incoming teeth and temporary relief. The best safeguard a dentist can have is to preserve if possible all of the sixth year molars until that condition has come about when the bones of the face have become perfectly developed and features set, the second molars, bicuspid and canines held in position by firm occlusion. Then and not until then do I consider it prudent for the first permanent molar to be removed. Everything is conjecture and visionary when we extract this tooth at an early age with such delusions as some authors advocate, to lead us. Our observation if closely applied will not direct or advise

such a procedure. The intelligence of the age demands of us all that our knowledge can avail, and it does not show that we are advancing when we resort to such practice as we have been taught to follow in the past.—CONNER, (W. B.,) *Ohio Journal*.

ARTICLE III.

APPLICATION OF THE RUBBER DAM.

BY THEO F. CHUPEIN, PHILADELPHIA.

Read before the Southern Dental Association.

I do not know that the few scattering items which I offer can be classed under the appellation of a paper, but as your chairman requested the bringing out of anything new, I present to your consideration such items as have been suggested during the year.

Cases occur in practice almost daily where this invaluable adjunct of dentistry becomes useless, because it cannot be properly applied. As a typical case, let us suppose an upper molar to be extensively decayed on its mesio-masticating aspect, while the tooth is intact on its distal surface. The decay has progressed so far above the gum where the tooth is decayed, that in order to prepare the cuncal margin the absorption of the gum is necessary. It is generally known that this may be effectually done by packing gutta percha between the tooth where we wish to effect such absorption. But though we may effectually produce this absorption at the point where the tooth is decayed, the gum adheres to the neck of the tooth in its normal position at all other points, and if we wish to apply the dam in order to aid us in filling such a cavity, we are thwarted on this account. To overcome this difficulty, we proceeded as follows :

Pack gutta percha at the distal as well as at the mesial surface of the tooth; when the gum is thus forced away from these surfaces, remove the gutta percha and mop gilling thread or ligature silk two or three times around the tooth, pushing this up well on the neck of the tooth, then tie and replace the gutta-percha at both proximate surfaces. Dismiss the case for a day or two, when the dam may be applied without the least difficulty, the gums having been forced well away by the gutta percha at its proximate surfaces, and by the ligature at other surfaces. Try it, and rejoice.

THE OIL OF CAJEPUT AND GUTTA PERCHA.

It frequently happens that there are cavities where the application of the rubber dam is inadmissible, but such cavities cannot be kept dry. Dr. W. H. Roop contends that by means of a very light film of the oil of cajeput, gutta percha may be packed into a wet cavity and made to adhere, either for a temporary purpose previous to filling with gold, or for a permanent filling where the material is not subject to the attendance of mastication.

The cavity is prepared under such circumstances without wounding the gum, the cavity made as dry as it may be with any absorbent that is used, and a piece of gutta percha just sufficient to fill the cavity is softened, and before it is introduced it is moistened with a film of the oil of cajeput, using no more on the pellet than what may be transferred to it from what adheres to the cork of the vial. To substantiate this Dr. Roop, at one of the meetings of the Pennsylvania Association of Dental Surgeons, procured a tumbler of water; he then softened a small pellet of gutta percha, coated this slightly with a film of the oil of cajeput, and with an ordinary ball bur-nisher pressed this against the inside of the tumbler beneath the water. The gutta percha adhered to the glass with sufficient force to not only hold its place but to require some force to dislodge it.

Dr. Roop also presented samples of gutta percha which

softened readily by the hot water bath, yet attained a sufficient hardness to enable it to be used on the masticating surfaces of the teeth.

ANNEALING GOLD FILLINGS.

Large contour gold fillings frequently get their corners chipped or broken off by accident or by too severe use, yet sufficient remaining in the tooth as to only require an addition made to the remainder to restore it to its former condition. This was formerly done by drilling pits into the filling and starting the new gold from these pits. Several devices within the past year have been suggested to so anneal the gold in the tooth so as to drive off all the moisture they may contain, when by simply roughening the surface of the filling, fresh gold can be readily started on the defaced plug.

One of the least expensive, readily made and most effective of these appliances has been suggested by Dr. D. V. Beacock, of Brockville, Canada. It consists merely of a small glass pipet. This is filled with cotton lampwick, with the merest end of the wick protruding from the glass pipet; by placing this in a vessel of alcohol and pressing the rubber bulb, and then removing the pressure, a sufficient quantity of the alcohol is drawn into the pipet to moisten the wick. The end may now be ignited, when it burns with a minute, almost imperceptible blaze. By using this carefully next the filling by degrees, the patient is not subjected to much discomfort, and the filling made so dry that fresh gold readily adheres to the old filling by simply roughening the surface.

The device was illustrated in the May (1892) number of the "Dental Office and Laboratory."

NEUTRALIZING DECAYED DENTINE AND SENSITIVE DENTINE.

We have been very successful in overcoming sensitive dentine in cases of exalted sensibility, by the use of a pencil of nitrate of silver applied to the decay. This agent blackens the surface to which it is applied; but when the

cavity is prepared and shaped for filling, the discoloration does not seem to permeate to any considerable depth, so that it is entirely removed by the excavating or cutting instruments, and the preparation of the cavity is almost painless.

We have also tried it to neutralize decay in large cavities in the sixth year molars of children's teeth, where these teeth have had such large cavities that if all the decayed dentine were removed, an exposure of the pulp would be the consequence.

We applied the nitrate of silver in such places in powder, rubbing it into the disorganized tissue and filling over this with gutta percha. As far as we know to the contrary, the operations have been successful.—*Southern Dental Journal*.

ARTICLE IV.

OSSEOUS UNION OF TEMPORARY TEETH.

BY W. A. ROBERTSON, D. D. S., COOKSTON, MINN.

While fusion of the teeth is uncommon, specimens are to be met with in almost every dental collection, showing that it occurs often enough to make it of practical importance to the dental practitioner.

Having just come into possession of an interesting specimen of this class, I thought it might be of interest to some of your readers to have it described. This specimen is of particular interest from the fact that one of the teeth is a supernumerary, and as the teeth belong to the temporary set, it is of somewhat rare occurrence, so that a short history of the case may not be amiss.

About three years ago the patient was brought to us by his mother to have some filling done on his front teeth. We were struck by the fact that there were five superior

incisors, there being three on the left side, two of which overlapped and were decayed. Upon preparing them for filling we found they were united, and drew the attention of the mother to this fact, at the same time asking her to save them for me when they were taken out. A few weeks ago they became so loose and sore that the application of a thread was all that was necessary to accomplish their removal.

Upon close examination there is perfect union of the roots, one of which is considerably absorbed while the other is almost entire. There is a shallow groove in front and a deeper one behind, showing the point of union of the roots. The fusion is perfect from the cervical margin to the apex of the root, and has the appearance of having originally included the crowns as well, but owing to the enamel being undermined by decay and broken away, it is not complete now.

In a case like this we might expect to find an extra permanent incisor, on the ground of the accepted theory of development of the permanent teeth, viz., from the cords of the temporary teeth, and we will watch this case with interest on that account, and report if such is the case.

The teeth are both well developed and are almost uniform in size, so that it is impossible to say which is the superior and which is the inferior.

As described in the American System of Dentistry (1849, Vol. III., fig. 115), a case very nearly similar to the one cut conveys a good idea of this one except that there are three teeth in place of two. It is from the collection of Dr. Douglas, Rosino, Michigan, and is the only case I can find recorded of union between a superior and a central incisor of the temporary set.—*Dental Journal*.

ARTICLE V.

STERILIZING SPONGE IN PULP CAPPING.

BY T. H. PARAMORE, HAMPTON, VA.

Read before the Southern Dental Association.

In a paper read before the meeting at Old Point, Va., of the Southern Dental Association, in August, 1887, I took this position: "Irritation and inflammation consequent upon a wound, is an effort upon the part of nature to repair the injury; the surgeon or dentist who renders nature greatest assistance in her effort at repair, comes nearest the ideal towards which we are struggling."

These views, the success attained in general surgery in the use of sterilized sponge, and a belief that nodules of asteo-dentine are unsuccessful attempts of the pulp to protect itself against decay, induced me to undertake the preservation of the life of an exposed pulp, a practice I had abandoned.

It is not my purpose in this paper to state the process of reasoning by which I arrived at my present mode of treatment. The idea in treatment is to place at point of pulp exposed a material that will catch and hold the bone forming product of the pulp so that it may form where it will protect, and not, as is often the case, in the body of the pulp, where it irritates.

As my friend, Dr. Wright, so aptly expounds it, "The sponge is the staging used by the pulp in erecting its fortifications." For more than six years I have been using sterilized sponge for this purpose with a success far greater than I at first dared hope. The following is my method of operating:

I assume that the cavity is prepared, the dam adjusted and the point or pulp-exposure clearly defined and visible. First, thoroughly remove all foreign matter from cavity.

2d. Cleanse perfectly with 1-500 per cent. solution of bichloride of mercury, fingers, dam, cavity instruments—everything that, directly or remotely, comes in contact with cavity. I use bibulous paper for this purpose.

The following preparation will be found very convenient, it does not deteriorate with age :

R

Acid Hydrochlorici	-	-	-	-	3i
Hydr. Bichloride,	-	-	-	-	3i
Alcoholic,	-	-	-	-	3i

M. Sig: 10 drops to one ounce, 1-500 per cent. solution.

3d. Hold the sponge, wrapped in oil silk, (never allow it to come in contact with the fingers) in the left hand, and with pliers tear off a piece the required size, place this upon the pulp at the point of exposure. This is, at times, very difficult to accomplish; it is sometimes necessary to dampen the cavity with bichloride solution, which renders it much easier.

4th. Fill with oxy-phosphate in the usual manner, being careful not to dislodge the sponge. The tooth often aches for some time after the operation, but don't disturb it; if the operation has been properly performed the tooth will get easy, and the pulp will not die.

For some time after I began this treatment, I allowed the oxyphosphate to remain in for several months, removed all, or part, of the oxy-phosphate, and filled permanently; but now, unless there is good reason for acting otherwise, I fill permanently immediately, or in a few days.

In quite a number of cases treated as described, I have found after some months the point of pulp-exposure covered and securely sealed by osteo-dentine, and the tooth alive and well.

In one hundred and fifty cases that I have been able to keep trace of, I have a record of twenty-three failures. I have a bicuspid filled as described in 1886, upon the anterior surface. In December, 1891, this tooth began to

ache by nerve exposure in a crown cavity. I will send this tooth to your honored president that you may all see how perfectly the pulp is protected on anterior surface.

I find this record of the case: October, '86, nerve capped, sponge graft. There is nothing more said about it on my book, but my recollection of the case is that it was bleeding. Please handle this specimen carefully—I prize it very highly.

I send this simple statement of my reasons for adopting this treatment and my experience with it, indulging the hope that it may prove as great a comfort to many other members of the profession as it has to me, and that it may yet become a blessing to mankind.—*Southern Dental Journal*.

ARTICLE VI.

DENTAL EROSION AND THE GOUTY DIATHESIS.

All who have studied the subject of erosion admit that there is a mystery which they cannot fathom; and yet there is a general belief that it is the result of an acid condition of the fluids of the mouth, more especially the product of the labial and buccal mucous glands. Granting that this be so, there must be some exciting cause which alters the character of these secretions, making them more than normally acid in their reaction, for the usual tests with litmus paper reveal a slight acid reaction in the mouths of nearly all persons, especially upon arising in the morning; and yet erosion is the exception, and not the rule.

That the exciting cause is a local one, the result of an irritated condition of the glands themselves, I cannot believe. That it is a constitutional derangement of the functions of the larger organs of the body, which alters the character of the blood-serum, I do believe.

The humoral pathologists, from Hippocrates to Garrod, believed that the cause of gout was to be looked for in the perverted physiological functions of the fluids of the body. Most modern pathologists are accepting the uric-acid theory of gout, as promulgated by Murray, Forbes and Wolloston; while still others believe, with Cullen, that gout is a trophoneurosis. Whatever the cause may be, the manifestations are so protean that there may never be a perfect harmony of belief as to its origin. One fact is well established; that there is in the gouty subject a decidedly acid reaction to all the secretions of the body. Whether this pathological condition is sufficient to produce the changes which we recognize in the oral fluids, I am unable to say. However, that there are remarkable coincidences, existing between the two diseases, there can be no doubt. Erosion, like gout, is a disease of advanced civilization. I have never seen it during the period of growth and development, when the processes of nutrition are active, and the consumption of food in excessive quantities is rendered possible by the large demands for the needs of the growing body and for the development of active energy. It is common in adult life, when the processes of nutrition are less active and when growth is complete, and when the supply of food needs to be regulated according to the amount of energy to be developed. Erosion, like gout, is more frequently than otherwise found in the person of those who live in luxury and refinement, and in an atmosphere where an abundant supply of oxygen is wanting. I do not remember to have ever seen a case of erosion in the mouth of one who earned his daily bread by the sweat of his brow. If, then, erosion be a constitutional disease, and in any way associated with the gouty diathesis, none but constitutional treatment will avail. I think it must be admitted that all efforts to arrest its ravages by local measures have resulted in failure. The heroic method of inserting gold fillings upon the eroded surface has done more than anything else to arrest its pro-

gress; and yet I feel sure that your own experience has taught you that in some instances this has been ineffectual. The ingenious device of Dr. Kells, of having the patient wear a rubber splint to protect the eroded surfaces from the action of the acid mucus during the night, or when the mouth is in repose, may aid in retarding the disease, but it cannot wholly arrest it.

It would seem that the most logical line of treatment is in the direction of primarily improving the digestion, by the avoidance of such articles of food as experience has demonstrated are incompatible with the gouty dyscrasia. If there is one signal peculiarity in the digestive arrangement of gouty persons, it is their limited power to digest the carbohydrates, the sugars and starches. In whatever form these foods are used, they are more commonly the source of the dyspeptic troubles of sufferers from gout than are the albuminous foods. They provoke the acid and flatulent dyspepsia which so generally precedes the explosion of the gouty paroxysm. Abstinence from all the fermented preparations of alcohol is one of the most important restrictions, on account of the unfermented dextrine and sugar which they contain. Experience has shown that the prohibition of some of the sub-acid fruits—such as, for example, strawberries, apples, watermelons, and grapes—is attended with beneficial results. Next in order to the saccharine foods as the source of indigestion in gouty persons, come the amylaceous aliments. These constitute necessarily so large an element in ordinary diet that the limitation of them in the dietary of gouty persons applies, in the majority of cases, only to their excessive use. The purely starchy aliments, such as potatoes and the preparations of corn and rice, and even those which contain a considerable portion of gluten, like wheat, oatmeal, and barley, often provoke in gouty subjects a great deal of mischievous and painful indigestion.

“Next in importance to diet as a hygienic regulation in the management of gouty patients, is enforced exercise.

The axiom of Abernethy, 'To live on a shilling a day, and earn it,' comprises the philosophy of the true relations of food to work, and both to the highest development of physical health. Exercise is to be enforced, not simply as the means of securing an active respiration, and thereby an abundant supply of oxygen, but also as a means of converting the potential energy of the food consumed into vital energy. The essential condition, moreover, of healthy nutrition in every organ and in every tissue, is the maintenance of a vigorous functional activity. Hence the question of exercise in its largest sense involves not only muscular work, but work of every kind which tends to promote a healthy activity of the psychical as well as the physical functions. Muscular exercise in the open air has a special value for the victims of the gouty dyscrasia, by equalizing the circulation, quickening the respiratory movements, and stimulating the elimination of effete matters from the skin and lungs. But mental work and wholesome diversions are not less important, as antagonizing the evil effects of indolence and over-feeding, which are among the common predisposing causes of acquired gout."—PROF. E. T. DARBY, *Dental Cosmos*.

ARTICLE VII.

COPPER AMALGAM—DISCRIMINATION IN ITS USE NECESSARY TO SUCCESS.

I do not know exactly what relations the different metals bear to each other in the state called fusion, whether the minute infinitesimal particles of each metal remain intact and distinct from each other; but, whatever fusion is, I think that the same condition exists in an amalgam. There may be particles of free copper in copper amalgam, and in the coarser grades I think there are; but their sur-

faces must be covered with an alloy composed of copper and mercury fused into each other. It is reasonable to suppose this coating of alloy has a perceptible depth, and the finer those particles are the more complete the fusion, and if we follow it up we can imagine a state of affairs when this fusion goes clean through the minute particles of copper, and then there would be no free copper contained in the mass. We can cover a piece of copper completely with mercury by rubbing it in; so, by grinding copper amalgam and breaking up the minute particles of copper and rubbing in the mercury upon them we get more complete fusion. But, better still, if the copper, in the first place, be precipitated in as fine a state as possible upon the mercury, we have a more thorough fusion still, for we know that copper precipitate, in a nascent state, amalgamates or fuses with mercury.

The precipitate from a strong solution of a cupric salt is coarser grained than from a weak solution. If the solution was diluted with an equal bulk of water, the precipitate would be twice as fine; the weaker the solution the finer the precipitate, and the more complete the fusion between the copper and the mercury, in short, the more thorough the amalgamation. I agree with Dr. Ames and Dr. Custer that the copper amalgam must be thoroughly amalgamated and of fine grain to give the best results. I go further and repeat what I have always maintained, that it must be thoroughly clean and free from all kinds of impurities, especially oxide of copper or mercury or any other metal. If we overheat it or allow it to become wet or damp while mixing, it becomes more or less oxidized and therefore unclean. I attribute the discoloration of tooth substance by copper amalgam fillings to impurities in the material.

I received a letter not long ago from a prominent American dentist asking me what was my theory concerning the wasting of copper amalgam fillings. He says, "we know copper amalgam will save teeth; now, we want

to know what will save the filling." I was obliged to confess I had no theory to advance. But I have been experimenting with the material for a number of years. I have made a great many experiments both in the mouth and out of it, and have kept a record of fillings put in and notes of the various methods employed and peculiarities observed. The results of my observations, I fear, do not amount to a great deal. They have certainly not led to the adoption of a theory. But I have learned to avoid many things which invite failure, and to recognize indications which promise success. I have noticed that failures are more likely to occur in some localities than in others, for instance: copper amalgam fillings placed in approximal cavities extending over the grinding surface of molars and bicuspid, are more apt to fail than all others. Large crown and contour fillings in molars come next. These fail from the wasting or cupping described before. Buccal fillings very rarely fail unless they extend to the grinding surface, when "cupping" generally takes place. Small crown and fissure fillings seldom fail, and approximal fillings, anterior and posterior, which do not reach the grinding surface, are almost invariably successful. The most permanent and successful I find are fillings in those shallow groove like cavities on the palato-cervical and linguo-cervical surface of molars and bicuspid, and sometimes of canines and incisors.

In my own practice I have very few failures, and I dare say it is because I use copper amalgam very cautiously. I never employ it where other amalgams would do as well, nor where experience teaches me it was likely to fail. I have never considered it to be a substitute for other materials, but rather a material to use where I knew anything else would fail. I have not begun to have the number of failures in my work that other dentists report in theirs, and I have seen more failures in fillings made by other dentists than in my own, but I think that is because they use it too indiscriminately. In fact some have told

me they have used it altogether to the exclusion of every other kind, and I have no doubt it is due to this fact that it has proved so disastrous in many hands. Dr. Trueman says that he "considers copper amalgam judiciously used, a valuable addition to our list of tooth-saving materials. It does not, however, supplant the alloy amalgams." He is disposed to think "that in the long run, those who use it most cautiously will appreciate it most highly."

I have never seen recurrence of decay around a copper amalgam filling, except in those small shallow buccal cavities in molars and bicuspid at the margin of the gum, where we find a disintegration and softening of enamel. I think the fault in these cases lies in not cutting enough of the enamel away in the first place. I would not blame the amalgam, as another material would have done no better—certainly not alloy amalgam. It is in those very same shallow buccal cavities where the use of copper amalgam is specially indicated, just there where it exhibits, in strong contrast to other amalgams, its peculiar unshrinking qualities. Even the small amount which good alloy amalgams shrink would be quite sufficient to cause it to "drop out."

Of course, in speaking of failures, one would not include those cases where recurrence of decay was caused by the accidental fracture of the tooth at the margin of the cavity. My experience has been that there is less liability of marginal fractures where copper amalgam is employed than where we use an alloy amalgam, and I account for it in this way: There being no shrinkage with copper amalgam, the enamel is better supported, and consequently not so apt to break. With some alloys we know there is considerable shrinkage, and a space is left under a thin portion of enamel inviting fracture sooner or later.

In mixing copper amalgam or preparing it for the cavity, if it is too soft it will result in disintegration and softening of the filling. Neither must it be used hard and

dry. See that it works with a smooth plastic finish under the burnisher. If it is dry and granular under a burnisher, it will result in failure. It is not difficult to determine the proper plasticity to give best results, as when it works smoothest and easiest is when it is right; and when it is properly mixed it certainly is a very pleasant material to work.

Do not insert the copper amalgam after it has begun to set, for your filling will fail. After it has begun to set it should not be reheated until thoroughly hard.

Dr. Ames argues that we heat and triturate it too much. Dr. Barnes and Dr. Osmun contend that we do not heat and grind it enough. It is my opinion we heat it too much and triturate it too little. When I say heat it too much, I do not mean too often, but with too high a temperature. Copper amalgam should be heated slowly over a small flame, care being taken not to raise the temperature too high. If care is taken, it does not matter how often we heat it and allow it to get hard again; the oftener the better; but I think that part of it is the manufacturer's business to attend to.

I would like to say a word in reference to mortars. It is important to have a good one. Some of the small porcelain mortars to be found at the depots are worse than useless—smooth inside, with a pestel also smooth and too small to grasp. Some of the larger glass and wedgewood mortars are better, but some of the pestles are too large. The mortar I have found to give the best satisfaction is a ground glass mortar and pestle made by Fletcher of England.—GEO. H. WEAGANT, *Dominion Dental Journal*.

ARTICLE VIII.

DISCUSSION OF "TOBACCO AND ITS EFFECTS."

Dr. Swain.—I desire to congratulate the essayist on giving us so good a paper upon this subject. I went to the books for ideas with which to open the discussion, but I found them very meager indeed; there was very little said about it, and most of that was that years ago it was considered to possess great medical virtues, but of late years the use of tobacco as a medicine has been largely discarded. I believe its curative virtue, if it has a good property, is that it is a sedative. The long continued use of tobacco is unquestionably, however, a nervous irritant, and any person who has used it for many years, either as a chewer or smoker, will, I think, concur in the statement that it becomes an irritant rather than a sedative. I question very much the statement that the excessive use of tobacco will help one mentally or physically. We have all observed in those people who have used tobacco for a number of years the conditions explained by the essayist, namely, the receding of the gums and the softening of the tooth about its neck. I can speak on this subject somewhat from experience; I used tobacco myself from childhood up to a little more than a year ago. I have chewed and I have smoked, and I am satisfied that my teeth were injured from the use of tobacco, not only in chewing from the grit which it contained causing mechanical abrasion, but in that peculiar condition which it produces of congesting the mucous surfaces which results in a disorder of the subcutaneous glands causing them to give off a diseased secretion which destroys the tooth. I don't know that I have ever observed any bad effects of nicotine or the product of combustion of smoking, on the enamel of the teeth other than to stain it; tobacco colors the teeth yellow, but the other conditions I have not noted during

my experience as a practitioner of dentistry. The worst results from the use of tobacco come from the smoking of cigarettes. The combustion of the paper, especially the cheaper qualities of paper, I consider very deleterious. Just what the products are I cannot say, but the condition of the mucous membrane of the mouths in those people who are confirmed cigarette smokers gives us all the evidence that is necessary that it is very injurious.

Dr. Gilmer.—My experience leads me to the belief that tobacco tends to prevent decay of the teeth. I recall a number of instances where patients have left off for a time the use of tobacco, and in these cases almost invariably has there been a remarked increase in the tendency to decay. So frequently have I observed this that I cannot but conclude that tobacco must have a preservative effect. If this condition were only found in the mouth of former chewers we might question whether the increase in decay did arise from the lack of friction offered by the chewing process rather than by virtue contained in tobacco, but I have seen similar results following the discontinuance of smoking but not so marked.

Dr. Harlan.—I do not rise for the purpose of defending the use of tobacco, but the thing I would like to know is which are you going to do, chew gum or chew tobacco? What is there about tobacco that will cause deterioration of the teeth? Tobacco is a vegetable, cabbage is a vegetable. Cabbage is an article of diet, but it is capable of being so treated that there will be so much lactic acid as to injure the teeth. Tobacco is never treated in that way, so that you do not get the ill effects of it in chewing or smoking. Opium is a vegetable, a so-called medicinal plant, it has a great many derivatives, many of which are used in medicine as sedatives, etc. Tobacco *per se* does not injure the teeth any more than corn husks or bean shells; not half as much as beans, for the simple reason that it does not contain the constituents that micro-organisms can live upon. It is the misuse and abuse of

tobacco that makes it one of the objects to which civilization is directing its eyes. The experiments which have been made with reference to smoking tobacco are successful as to its properties in that respect; but does tobacco smoke affect the teeth? If it does, it does it beneficially, that is, it will destroy the micro-organisms on which the proliferation of dental caries depends; but tobacco used in chewing is used in a bad way.

One of the reasons why people suffer from stomatitis and things of that sort is because they do not use anything that will act as a laxative, and tobacco to a great many people is a laxative, and in so far as it is a laxative it is beneficial to health. Nine-tenths of the bad smells which you encounter are not due to the supposed gases at all, but to the inaction of the alimentary canal. If you do not bathe, or if you do not drink enough water the contents of the alimentary canal are not discharged and consequently people suffer from bad breath. They perspire from the whole glandular system; and are disagreeable to every one who comes in contact with them. Those people I recommend to take a smoke. You know what tobacco is, but the other odors comes from unknown and unseen sources that you do not know anything about.

With reference to the effects of tobacco on the teeth, there is a circle all around the necks of the teeth above the termination of the enamel that it is due to filth, that is due to the continual bathing of the mouth with the fluids, the juices that are extracted from tobacco by chewers. I have known any number of men who have chewed tobacco moderately and who are sixty-five and seventy years of age and their teeth are all sound, and I have known others whose teeth have decayed rapidly, but they would have decayed anyway.

With reference to the wearing down and mechanical abrasion, I had in my office to-day a gentleman who has eight teeth in his upper jaw and nine in his lower and he never chewed tobacco in his life, and all of these teeth

have worn down until they are nearly to the gum. So that it is not an uncommon thing for the teeth to be worn down by persons who are not tobacco chewers. I don't defend the habit; I never smoked until I was twenty-five years of age and I didn't do it then from choice, but I do now and tobacco is a great satisfaction to me every summer, and it is to any man who may be walking in the woods, traveling in a boat, or be in a solitary condition. I apprehend that it is more used by people who are in the habit of thinking by themselves and who want to be undisturbed, and they use it for its sedative properties, probably, in the same way as some other people use articles of food. There is no doubt but what there are many people who eat too much pie every day, and pie is very much worse than tobacco if you eat three pieces a day, and if you eat ice cream every time you get a chance it is a very bad thing for the coats of your stomach. If you go to discussing tobacco on its merits I will put it against any vegetable or animal tissue that is used for the purpose of nutrition, because it prevents waste. A man can take a chew of tobacco, or smoke a pipe or a cigar and he can endure more, he can walk further and go longer without water to drink than the man who simply eats the same quantity by weight of oats or wheat or corn or rice or animal tissue. So I say it prevents tissue waste, and that is the reason why the whole civilized world has taken up its use. I do not discuss the question of the use of tobacco simply on account of its preservative or its non-preservative qualities on the teeth, because it is inert, it does not affect the teeth at all. There is nothing in tobacco deleterious to the teeth and micro-organisms will not pry into tobacco juice. I simply state that as a proposition which any scientific man here can disprove if he has the necessary proof. Tobacco juice will not ferment when it is mixed with saliva and if you don't have a fermentable substance you don't have anything that putresces, and so you have to leave that out of the question. There is no

doubt that tobacco will stain the teeth after the enamel has been worn off; there is no doubt that it will, on account of this agency around the necks of the teeth, tend to promote an aggregation of foreign particles and large deposits of salivary calculus, a form of which is the *lepothrix buccalis*, and that is one of the most annoying organisms that live in the mouth. One of the greatest scientific men in dental surgery advances the theory that caries is caused by *lepothrix buccalis*. It is claimed that micro-organisms never produced caries in the world but on account of their location on the teeth and growing on what they were fed, that in the decomposition of the saliva in consequence of the coming in contact with it of ammoniacal products and the liberation of the elements by which they grow; and if dirt and grease, and things like that collect around them, perhaps there might be cavities. I don't advise any person to begin the use of tobacco, to chew or smoke it; I simply say from the standpoint of science that tobacco as tobacco is not injurious to the teeth at all.

Dr. Newkirk.—Having used the weed at one time myself, I think I can look at the tobacco question fairly. I believe that some of the accusations presented against it to-night are true, that on the whole it usually does exert an injurious influence, especially upon the nervous system; that it very frequently has a bad effect on the action of the heart, and that physicians frequently meet with cases where they would be very glad if they could prohibit its use. Frequently they try to have their patients use it more moderately if they cannot get them to give it up altogether. Before the discovery of America civilized man did not know anything about tobacco. We might suppose, from the eloquent plea which we have heard from Dr. Harlan, that tobacco is probably the greatest civilizer which this world possesses. See how man has advanced during the last century since the introduction of tobacco into Europe? The only fault in that theory is that the poor Indian, who has used it a great deal longer, does not

seem to have advanced at all. It has had one effect upon him and another upon us. There are a great many habits in the world that are hard to account for on any reasonable grounds. I think most people form certain habits because others do, just because it is the fashion. There isn't anybody who can give a sensible reason why the ladies should be trailing their skirts along our streets at the present time. There is no reason why they should and there is every reason why they shouldn't. I saw one of the most prominent reformers in my office yesterday. "Well," I said, "fashion has you by the skirts." She said she had to fall in with the fashion, she couldn't be singular; so I suppose that is why a great many people chew tobacco and drink, and why they do a great many things, just because other people do. There is no philosophical reason for it.

I have not in my experience seen the same things which Dr. Davis [the essayist] advanced with regard to pyorrhœa. I do not remember that I have ever seen a case where I had reason to suppose the disease was produced by the use of tobacco. I have seen some of the worst cases in the mouths of those who have not used it, and I should not consider it essential in the treatment of a case to insist upon the patient leaving off. However, in chewing, masses of the weed are sometimes forced into the interspaces of the teeth, crowding the gums at the gingival margins. This acts as a mechanical local irritant and I believe has more ill effect than anything in the chemical action of the tobacco.

Dr. Ottofy.—I expected that the essayist might be able to state the reason why tobacco affects the teeth favorably. I did not think there were any who claimed that there was not some peculiar effect from tobacco upon the teeth. I do not think there are any dentists who claim that that effect is not beneficial; at least I have never heard anyone say that tobacco smoke is injurious to the teeth. We attempt to explain the cause as though it was exerted on the

exterior of the tooth, but it has been for some years my opinion that tobacco smoke affects the teeth favorably through the internal circulating medium, the nicotin in the circulation in all probability exerts its influence *within* the tooth. I have always noticed that a dead tooth in a consumer's mouth is much softer and more chalky than a dead tooth in the mouth of any one else. No man can smoke and not inhale some of the smoke; in this way he gets the nicotin into the circulation very rapidly; it goes at once into the blood, being transmitted in the lungs, is circulated and brought into the tissues and the teeth, and it is there that I believe it exerts its influence. I believe that in chewing the beneficial effects are counteracted by the unfavorable effects on the soft tissues of the mouth; however even this habit is a benefit to the teeth by means of the nicotin being introduced into the teeth; it is injurious to the teeth, because chewing tobacco does contain impurities, especially molasses, sugar or grit, which will affect the gums and teeth. A habit the chewer forms, is to place the tobacco on one or the other side of the mouth on the outside of the teeth and let it rest there, which eventually results in the destruction of the gum tissue, thus overbalancing the benefit he derives from the tobacco. I would like to see the essayist continue to investigate, and determine if possible, where the beneficial effect of tobacco smoke in the mouth comes from; whether it is the effect of the tobacco upon the enamel or whether it is the effect of the tobacco in the circulation through the pulp upon the dentine.

It seems to me that whatever beneficial effect the use of tobacco has in preventing caries of the teeth is ~~probably~~ due to its antiseptic properties. Smoking or chewing is one of the commonest ways in which some antiseptic influence is exerted within the mouth with sufficient regularity and duration to accomplish any appreciable result, and it does not seem necessary to go any further than that to account for the ordinary beneficial results from the use of tobacco in respect to the preservation of the teeth.

Dr. Hartt.—I don't think we are looking at this subject in the right light; if tobacco preserves the teeth it does it in a very unsatisfactory manner, and we as dentists owe it to ourselves and to our brothers, to discourage the use of tobacco, because it not only destroys the beautiful appearance of the teeth, but causes a man to become careless, taking less pride in them. In addition, the man who sells the tobacco gets the money that the dentist ought to have.

In a word, let the tobacco fiend worship at the altar of his family dentist, and arm himself with a good tooth-brush, and he will then have very little excuse for continuing in a habit which is not only expensive, but very annoying to the majority of refined and cleanly people.

Dr. Brophy.—A number of years ago when the question of the preservation of the teeth by the influence of tobacco was under consideration, I had a discussion with a friend of mine who told me he had been making some experiments with a view to ascertaining whether tobacco really does preserve teeth or not; he believed that tobacco was an antiseptic and would preserve the teeth, he believed that smokers' teeth were better than the teeth of those who do not smoke, and that the teeth of chewers were better than those of people who did not chew, and he was surprised at the result of his experiments. He told me that he placed some extracted teeth in a solution of tobacco and in the course of six or eight weeks they began to disintegrate, the action of the tobacco upon them was similar to that brought about by the influence of acids. The gentleman who made these experiments was Prof. Haines of Rush Medical College. I wish Dr. Davis, if he intends to pursue this matter further, would see Dr. Haines and learn his conclusions and get the benefit of his experiments upon the teeth with tobacco. I mention his name because he is recognized everywhere as an expert upon the subject of chemistry and the results of his experiments would have a great deal of weight in settling the question.

I would say that the tobacco he used was bought at the stores where tobacco is sold to men who chew and smoke; I don't know that there is any such thing as pure tobacco. The experiments Sir Humphrey Davy conducted for over four years, with a view to procuring pure water, did not succeed. There is nothing absolutely pure; all substances are more or less adulterated.

Dr. Davis, in closing the discussion, said: As stated in the beginning of my paper, when I first took up the subject, I hoped to find some good argument in favor of tobacco, so I read, or looked over some twenty or thirty different authors, and laid just two aside who spoke favorably of the use of tobacco, and I have quoted from these two on this subject. Nothing would please me better, from the standpoint of a smoker, than to have some good authority for a favorable judgment in this matter, and I would have liked to have heard more in its favor by those who discussed the subject this evening, but only one person has spoken to any extent in its favor, and I for one should have been pleased if he had talked longer, as I wish to obtain all the favorable argument I can on this subject.

There is no particular point I can touch upon; there have been a few things said which I might criticise or emphasize, but I think on the whole the matter has had a thorough exposition.—*Dental Review*.

ARTICLE IX.

DISCUSSION UPON THE DESIRABILITY OF EXTRACTION OF THE SIXTH-YEAR MOLAR.

The chairman, in introducing a discussion on "The Desirability of Extraction of the Six-year-old Molar," said the subject was of the greatest interest and importance in the treatment of youthful mouths. The subject might be

considered generally as the treatment of irregularities and overcrowding of the human teeth. Their special point for discussion, however, was the tendency of overcrowding to prevent the destructive effects of caries, whether it might be justifiable as a conservative measure in cases, where they saw indications of danger to the youthful denture from this cause, to remove an upper and a lower tooth from each side of the mouth with a view to the giving of space to the anterior teeth, permitting them to settle, and as nearly as possible, isolate themselves, thereby preventing the inception of carious disease in such teeth, as had not already been attacked; and if such a measure was justifiable, which teeth should be selected for extraction so as to give the necessary relief, and when would be the best time for extracting to secure the best results for the future of the mouth.

Dr. I. B. Davenport (Paris) said it was deplorable to realize how little was known of the true function of the organs of mastication. Men constantly attempted the treatment of cases of irregularity with their ideas of where the imperfection lay, and of what would constitute perfection quite reversed, and it was not surprising that disappointment resulted. His researches showed him that it was at first necessary to demonstrate so obvious a fact as that lateral contact of the teeth was an essential factor in a normal arch, and that good arches could not be disturbed without injury. This he was obliged to do because thousands of dentists the world over were mutilating the teeth both by extracting and cutting between them, on the theory that "contact is dangerous," and who did not realize the consequences of broken arches, and even to-day that fact was not enough appreciated. Good dental arches possessed such an arrangement as to be mutually self-supporting, thus tending to their own preservation and highest functional power. If a portion of the dental arches were removed, they fell together, and the new arches thus formed were apt to be unstable for want of

proper support, and often pushed out into irregular shapes at the points of feeble resistance. When the arches fell together after extraction the roots of the teeth moved less than the crowns, and so the relations of the grinding surfaces were disturbed, and much of the interlocking support of the masticating surface was lost, and a large space was left which required much diminution in the size of the arch to obliterate. When the jaws were at rest there ought to be broad and firm contact between the two arches all around, and during any masticating movement there should be extensive progressive contact, as the articulation moved from one place to another. He had been criticised for insisting upon the application of knowledge of perfect or good arches in considering the results of treatment of imperfect arches, and it had been claimed that a correct judgment of a case could be reached only by comparison of the jaws before and after extraction. No source of knowledge could be despised, and he was as much in favor of employing that method of research as anybody could be. Much might be learned by comparing results with previous conditions, but the value of an opinion by such comparison as to whether improvement or injury had been done, as well as the ability to detect them, must inevitably depend upon the knowledge they possessed of what constituted a perfect denture. There were perfect elements of error in the comparison of results before and after extraction. What might appear to be a better result at one period might be bad later, after the unbalanced forces had had a longer time to exert their influences. Take the slowly developing child that seemed to be "all teeth," a comparison of photographs years after extraction with one showing the previous condition of the child would be valueless as indicative of the degree of improvement of the features. Such were the cases with which some dentists delighted to dabble. The parents thought "the girl horrid," and "something must be done" they said. The too-supine dentist ex-

tracted the teeth, and after a time compared the two conditions as shown by models, and parents, dentist and all were happy. To contrast the actual results obtained with models of the past conditions without taking cognisance of the possible and not improbably changed condition produced by time alone, was, in his opinion, unscientific at least.

Mr. G. C. Campion (Manchester) said they would find in the new books which had been prepared for the use of the School Investigation Committee, that carious teeth were classed into two categories. There were carious saveable teeth, and carious unsaveable teeth, and among the latter were a large number of six-year old molars. When it was proposed to illustrate the results of the extraction of the six-year-old molar it seemed to him and others that it would be a useful thing to have some models showing the results of extraction of those teeth at different times, so that they might find out under what conditions of the development of the denture it was best to remove those carious unsaveable molars in order to produce the best possible results in after years. In photographs of models which have been taken in cases where the six-year-old molars had been removed, what he thought they would notice was that where the lower molar alone had been removed and the upper left the result upon articulating was very bad, and that where the six-year-old molars above and below had been taken out the result was very much better. In future cases, dentists ought to make a point of taking models before molars were removed as well as afterwards. By such a course they might gather a large amount of evidence upon the point which would be of great practical utility.

Mr. G. Cunningham (Cambridge) said that in the university town where he lived he had ample opportunity of seeing how great was the neglect of the teeth among the young men of the country. He quite agreed with previous speakers as to the necessity of models being taken to

establish the desirableness or otherwise of removing the six-year-old molars, in cases of irregularity, and he produced a number of highly ingenious models which he had himself made.

Mr. C. S. Tomes (London) said the dental arch theory was untenable in the present case, because the key stone of an arch was not in its side. It was the side of the denture where the force of mastication came and they were talking outside the mark when they talked about the spring of the arch. Formerly he used to take out the six-year-old molars in case of irregularity, but now he would rather take out a sound bicuspid than a somewhat damaged six-year-old molar.

Mr. W. B. Pearsall (Dublin) said he looked upon the man who extracted six-year-old molars, if they were sound, as a criminal. He held that a bicuspid could much better be sacrificed.

Mr. Mundell said he had recently examined 160 boys in an important school and had found the most of them would have been benefitted by the extraction of the six-year-old molar. Much depended upon the constitution of the teeth. If the teeth were weak, he held that they should extract the molars so as to allow the bicuspid to be useful in after life.

Mr. F. Rose and Mr. Storer Bennett also spoke.

The Chairman, in bringing the discussion to a close, said the great end every dentist should aim at was the preservation of the greatest number of teeth in the soundest possible condition.—*Dental Record*.

ARTICLE X.

THE WORLD'S CONGRESS AUXILIARY OF THE
WORLD'S COLUMBIAN EXPOSITION.

PRELIMINARY ADDRESS OF THE COMMITTEE ON A DENTAL
CONGRESS.

It is the aim of the World's Columbian Exposition to gather the evidence of the material progress and achievement of the civilization of the world, and to so arrange them that every department of human endeavor may be studied and examined through all its various grades of development.

It is also their desire to represent the intellectual and scientific development and achievement of the entire civilized world by a series of great Congresses, to be held during the progress of the Exposition.

In pursuance of this object, the World's Congress Auxiliary was organized by the World's Columbian Exposition, and it has received the recognition and support of the Government of the United States.

It is the plan of the World's Congress Auxiliary to bring into communication, through these Congresses, the best thinkers and workers in every department of knowledge, including religion, science, philosophy, literature, art, agriculture, trade, labor, etc., and by the presentation and interchange of ideas, methods, theories and practical experience, to promote the advancement of all that is noblest and best of our present civilization.

Committees have therefore been appointed to organize a series of Congresses, representing nearly every field of thought and of speculative and practical endeavor.

The field of professional achievement, medicine and surgery, in their various special applications, will form a very large and interesting feature of the work of the World's Congress Auxiliary.

Dentistry is an important department of medical science, and an outgrowth of our modern civilization. Its present perfection is in considerable degree due to the thought and labor of American minds.

The history of modern dentistry is covered by a period of less than two generations, and yet it has advanced from the rude operations practiced by the blacksmiths and barbers, to one of the most scientific and exact of the specialties of the healing art.

Scientific Dentistry had its birth in the United States of America. This country has the proud distinction of having organized the first school for the teaching of dental science, and the establishment of the first periodical journal devoted to the interests of dentistry, while very many of the most useful appliances and scientific methods have originated on this side of the Atlantic.

It is therefore eminently fitting that dentistry be represented at the World's Columbian Exposition by a display of the progress which has been made in the development of its materials, instruments, appliances, processes and methods of practical nature, and in scientific research, literature and professional education.

With this end in view the dentists of the United States took steps in August, 1890, to organize such a World's Congress, by the appointment of a General Executive Committee, to whom the whole subject of organizing and conducting the Congress was referred.

The work therefore of the Committee on Dental Congresses appointed by the World's Congress Auxiliary will be chiefly in co-operation with the General Executive, in publishing to the world from time to time the progress of the work of organization, in promoting the interests of the Congress in every way within their power, and keeping it in harmony with the general plans of the World's Congress Auxiliary.

Every effort will be made to secure the best talent in the presentation of scientific subjects, and in practical demonstrations.

The World's Columbian Exposition, through its Directory, will provide ample accommodations for all the various World's Congresses to be held in Chicago in 1893. The Memorial Art Palace, now in process of erection on the shore of Lake Michigan, and located near the center of the city, will be devoted to this purpose. This building will contain two large audience rooms, with a seating capacity of about three thousand each, which will be used for the general Congresses of the various departments, besides numerous smaller rooms, suitable for the chapters and sections of the Congresses, thus affording for the Dental Congress ample accommodations for clinical demonstrations of a suitable nature.

During the sessions of the Dental Congress several popular evening meetings will be held, to which the general public will be invited. At these meetings, which are intended to be educational, illustrated lectures will be delivered by some of the most eminent men of the profession on topics which are deemed to be of vital importance to the public. These meetings will be especially under the control and management of the World's Congress Auxiliary. When the suggestions of the Advisory Councillors of the Dental Congress shall have been received as to the most interesting and vital questions to be presented, a program will be arranged for publication.

A cordial invitation is extended to the dentists of the world to take part in the scientific work of the Congress by the presentation of papers and discussions, or demonstrations of new or improved methods and appliances

America, and Chicago in particular, will have a hearty welcome for all who may come.

An earnest effort was made to bring the meeting of this Congress in close connection with others of the Department of Medicine, but that effort having proved unavailing, arrangements have been effected under which the meeting of the dental profession will be held on or near August 17th, and is expected to continue during the week or ten days following. Definite dates and details will be given in the program.

Communications in reference to the special work of the Congress should be addressed to Dr. A. O. Hunt, Secretary World's Columbian Dental Congress, Iowa City, Iowa, U. S. A.

Communications in reference to the general work of the World's Congress Auxiliary, and suggestions from the Advisory Councillors, may be addressed to the Chairman of the Committee.

DR. JOHN S. MARSHALL, *Chairman*,
No. 34 Washington street, Chicago.

DR. A. W. HARLAN, *Vice-Chairman*.

Dr. G. V. Black, Dr. C. N. Johnson, Dr. Geo. H. Cushing,
D. N. Nelson, Dr. A. E. Baldwin, Dr. A. W. Freeman.
Dr. E. S. Talbot, Dr. George A. Christman.

Committee of the World's Congress Auxiliary on a Dental Congress.

Editorial, Etc.

RETROSPECT AND PROSPECT.—Everything in this world has a beginning and an end. The current (December) number marks one year's connection of the writer with the JOURNAL, which in that time has spoken on a great variety of subjects. For the coming year it is expected that additions will be made in the interest and value of the contents, and that the features will be so shaped as to be an aid to the dental practitioner. While during the year the JOURNAL has been made up partly of selections from other periodicals with only occasional original articles, and has been issued often three months behind date, yet it is gratifying to know that the contributions have been of general interest, and that the publishers have determined not to let the issue get behind again.

In the future through reviews of current periodicals, subscribers of the JOURNAL may learn their contents and thus be enabled to select judiciously additions to their libraries.

For years THE AMERICAN JOURNAL OF DENTAL SCIENCE maintained a foremost place, and was the medium chosen by the best minds of the dental profession for the

presentation of their papers. Why cannot the brightest talent be enlisted again in its behalf? Original contributions are solicited, and authors will be supplied with copies of the JOURNAL.

Some of the original topics discussed in the numbers of the JOURNAL published this year have been: "Concentration as a Principle of Success"; "Dental Legislation" together with the dental laws of Maryland, of Texas and of the District of Columbia; "The Conservation of Eyesight in Dental Operations"; "Opposition to a New Dental College"; "How We Treat and Fill the Canals of Abscessed Teeth Successfully;" "Bridge and Crown Work"; "Dentists and the Census Bill;" "The Dentist a Teacher"; "Culture and Professional Success."

Dental Society proceedings, papers published in other periodicals in this country or elsewhere, have also been reprinted or condensed.

R. G.

Monthly Summary.

GOLD WASTE OF VALUE.—When the American Waltham Watch Company moved to new quarters in May last, they left behind a snug fortune in the old buildings in Bond Street, this city, in the shape of minute particles of gold among the old rubbish and in the cracks of the pine flooring. The precious metal has been reclaimed, however, by the Irvington Smelting and Refining Works, at Irvington, N. J., in the form of bars of yellow gold. The total value of the gold reclaimed is between \$65,000 and \$67,000. The gold recovered must have accumulated since 1879, when the factory was occupied by the firm. An average of 350 gold watch-cases were turned out every day, each case weighing from twenty to fifty penny-weights. The gold was valued at eighty cents a penny-weight, and during a year it was estimated that more than \$500,000 worth of gold was used in the manufacture of watch-cases.

The water in which the workmen washed their hands, the mats on which they walked, and the towels with which they dried their hands and faces were carefully preserved, and at the end of every month were strained or burned and the residue afterward smelted and refined. About \$1,000 a month was saved in this manner. Every summer parts of the flooring were taken up and smelted, and sometimes as much as \$7,000 was realized in this way.

To obtain the gold concealed in the cracks and crevices in the old building, wagons were especially made to cart the old material from the factory to the smelting works, and every stick of wood in their premises was taken away. The planks of the floors were sawed into small pieces and then burned. The ashes were subjected to a chemical wash and the gold extracted.—*Scientific American*.

ARROGANT CRITICS.—Every thinking man is more or less a critic. But there are critics and critics. When a new idea, or an old one renovated, is presented for discussion, some critics will examine it with but one object—the unselfish desire to get at the truth. Others will measure it by their one and only standard of mathematical certainty—its exact correspondence with their own preconceptions. Dentistry, like other occupations, is not exempt from the professional Thersites, who love to bring the modest efforts of their fellow-workers into ridicule: who set themselves up, not only as connoisseurs, but as professional scolds, and who think “when they ope their mouths, no dog should bark.”

One cannot be too severe upon the advertising quack and impostor, but it is discouraging to men who mean well, but who do not assume infallibility, so to find their humble efforts sneered at by some arrogant critic, who is never happy but when burning the incense of admiration before his own productions.

As a rule, the truly great men in any sphere are not those who find it necessary to depreciate thought and labor they have not themselves performed. The truly great are those who welcome every honest search for the

truth, and whose criticism is crowned by their charity. Many a worthy young man is deterred from literary and scientific effort in associations by the stupendous arrogance of some self-elected "Great I am," whose over-bearing conceit blinds him to the fact that another man may possibly be right, and he altogether wrong. The profession is, however, full of generous critics and noble men, who make no pretence themselves to omniscience, and who do not expect it in others. We have pleasant recollections of the charity such men extend to their confreres, in personal associations with the Odontological Society of New York, and no doubt the success of that illustrious body is due not only to the zeal and ability of its members, but to the fact that in criticism they never forget they are gentlemen.—*Dominion Dental Journal*..

ARTIFICIAL INDIA RUBBER. — Dr. W. A. Tilden discovered some months ago that isoprene, which can be prepared from turpentine, under certain circumstances changes into what appears to be genuine India rubber. Bouchardat had also found that the same change could be brought about by heat. The material so produced resembles pure Para rubber in every way, and, whether it is genuine rubber or not, it may be equally good for all practical purposes. It is said to be capable of vulcanization.—*Scientific American*.

ANOTHER CASE OF INSANITY CAUSED BY NITROUS OXIDE GAS.—Miss Lizzie Lots, the beautiful daughter of Mr. Otto Lots, a prominent citizen of Covington, Ky., is now at College Hill Sanitarium receiving treatment for her mind. The family claim that Miss Lots became insane through taking nitrous oxide gas for the extraction of two teeth while visiting at Indianapolis.

Her sister noticed her condition of mind, and immediately sent her home. She seemed to be all right for a few days, but occasionally claimed that she had gas in her head. She would tell her father that he was to be the next President of

the United States, and that he would reappoint Mr. Harde-
man as postmaster of Covington. Again, she would talk on
all sorts of financial schemes of great magnitude. Her con-
dition finally became so alarming that her folks were com-
pelled to remove her to the sanitarium for treatment. She
now speaks of the sudden spells she had at home. Her father
is confident that her malady was caused by the taking of gas
and pulling of her teeth. He declares that the girl was never
sick in her life before, and that her mind became impaired
immediately after she had her teeth extracted.

Mr. Lots is borne out in his statements by his other
daughter, who lives at Indianapolis. She is a favorite child,
and her venerable father is almost prostrated over her con-
dition. He has given her all the medical attention that he can,
but grave fears are entertained as to her ultimate recovery.
She is well known among the people of Covington, and had
a successful business. Her father is enraged over the treat-
ment she received at the hands of the dentist in Indianapolis,
and he has employed Senator Goeble, of Covington, to bring
an action for damages against him.

Miss Lots is a striking beauty and highly accomplished
in music. She is about twenty-two years of age, and a
brunette of purest type. She is very popular among all her
acquaintances, who will be surprised to learn of her distress-
ing malady. Her parents reside at 1003 Greenup street,
Covington.

DEATH IN A DENTIST'S CHAIR.—Mrs. Philip Sebest, a
comely married woman, met death in a dentist's chair in
Elmira, N. Y., recently. The cause of her death is not fully
accounted for by the physicians, as the autopsy showed her
heart to be in a normal condition, and a combination of causes
was the verdict of the doctors. Shortly before five o'clock
Mrs. Sebest went to the office of Dr. G. H. Preston, on West
Water street, to have some teeth extracted. He administered
nitrous oxide gas, and placed his nippers upon the tooth to
be extracted. Mrs. Sebest said to the dentist that she felt

the pain, and wanted the dentist to administer more gas, which he refused to do. When the tooth was drawn she uttered a scream, and spat some blood in the cuspidor, gasped, and fell back in the chair, dead. Drs. C. W. M. and M. M. Brown were summoned, and also Coroner Westlake who made an examination. It is claimed that Dr. Preston had before, on several occasions, administered gas to Mrs. Sebest without injury, and it is thought that the excessive heat, pain and excitement brought on a stroke of apoplexy. Mrs. Sebest's sister was with her at the time the operation took place, and certified to the fact of the dentist's refusal to administer gas a second time.—*Items of Interest.*

DEATH FROM SYNCOPE.—On the 9th of August last, Dr. E. A. Guilbert, a prominent physician of Dubuque, Iowa, gave what is known as the A. C. E. mixture, to Mrs. J. C. Fitzpatrick, of same city, aged about thirty years, in good health, for the painless extraction of teeth, in the office of Dr. J. V. Konzett, a prominent young dentist in Dubuque, who extracted the teeth. The lady is thought to have been under the influence of the anæsthetic about twenty minutes, and yet was capable of resisting the efforts of the dentist at least part of that time, and seemed to have partially recovered from the effects of the anæsthetic, when all of a sudden she ceased breathing.

We further learned from both the dentist and physician, that there was positively no purpleness nor deathly pallor till after the functions of life had ceased, which is abundant evidence that the patient was not asphyxiated by the anæsthetic.

Again, it was quite a little time after the anæsthetic had been administered, before the heart and lungs refused to perform their functions, which precludes the possibility of the death from what is commonly called a shock from the chemical action of the drug. Therefore, if neither asphyxia, nor paralysis of nerve center by the anæsthetic, were produced, then the anæsthetic could not have killed the patient. Hence, the patient must have died from syncope, with partial nar-

cosis. As syncope is always produced by the mind, or an acquiescent condition of the mind, the probability is that the strange sensations of the anæsthetic as felt as the patient was recovering consciousness, caused fright and syncope, which with partial narccosis, is a very unsavory condition, and should always be obviated by the administrator describing the manifestation of the anæsthetic. If this be neglected before administering, the patient having heard of deaths from anæsthetics, or so-called anæsthetics, would very naturally think that the pricking sensation and numbness, or strange, cold, numb feeling creeping all over, were but the chills of death, and be terribly frightened and faint.

The only censure in the above case would be for not having the corsets and skirts properly loosened, and the necessary agencies at hand to resuscitate the patient, and perhaps not having properly described the manifestations of the anæsthetic when about to administer. Yet it is due the physician and dentist that when they discovered the perilous condition of their patient, that they used every available means of resuscitation, and yet without success.—*D. & S. Microcosm.*

TREATING AN EXPOSED, OR PARTLY EXPOSED, PULP.—

First saturate the cavity with "heaven's" cordial, and a little of the following mixed with it; one part oil cloves, three parts carbolic acid made into a soft paste with tannin. If you have not heaven's cordial, use in its place chloroform. Then clean away all debris from the cavity, as well as you can, without disturbing the pulp. Be careful not even to lift the thin, leathery layers of softened dentine from over or near it; for the less the pulp is disturbed the surer the treatment. Now, cut down weak walls, and be as thorough in preparing the cavity for filling as possible, without impinging on the pulp. Rub a little of the obtundent in the cavity (but not enough to saturate), and over the flow a coating of chloropercha. Blow on warm air to evaporate the chloroform, and then fill the cavity with oxyphosphate, put in rather thin, so as to avoid all pressure, and also so that it will stick to the walls of the cavity.

In from four to six weeks the pulp will be incased in a beautiful tanned covering. This should not be disturbed. The best way is to have everything intact, except to remove a little of the oxyphosphate, so as to give room and undercut for a permanent covering of alloy of gold.

Before this, however, and during the healing of the pulp, there may be an accumulation of pus. If so, remove the temporary filling, thoroughly syringe with hot water, and after flowing over a little peroxide of hydrogen, then repeat the first dressing, though of course a favorable result is not so sure.—*Items of Interest.*

SUDDEN DEATH.—Mrs. Kate Ledbetter, daughter of Peter McCue, who lives near Oakford, died in Dr. Solenberger's dental office Wednesday evening, while under the influence of an anæsthetic, which, at her request, had been administered by Dr. Whitley, preparatory to having some teeth pulled. Coroner McAtee held an inquest, at which it appeared in evidence that the usual precautions had been taken, before and during the administration of the anæsthetic, which Dr. Whitley stated was hydrobromic ethyl, used for short operations. The coroner's jury was composed of Z. A. Thompson, foreman; A. E. Estill, E. H. Bigelow, Mat. Hainsfurther, E. R. Oeltjen, H. C. Levering. They returned the following verdict.

"We, the undersigned, jurors, sworn to inquire of the death of Mrs. Kate Ledbetter, on oath do find that she came to her death by paralysis of the heart. We further exonerate all parties from blame."

The body was taken to the residence of J. D. Roberts, where it was prepared for burial by undertaker Conant, and taken to Oakford on Thursday morning's train, the funeral occurring yesterday.

The deceased was the wife of Frank Ledbetter, a Wyoming ranchman, and was here on a visit. Her husband was coming through to Chicago with a shipment of stock and was to stop here on his way home. Mrs. Ledbetter was about thirty years of age.—*Democrat*, Petersburg, Ill.

[The above verdict is a sad comment upon the intelligence of the coroner's jury. Did ever any animal or man die without the heart being paralyzed? The object of a coroner's jury is to ascertain the cause of the death, if possible, and to designate the cause in their verdict. The lady died, but what caused the paralysis of the heart or death? Was it the drug administered, or the manner of making and administering the anæsthetic that caused the death; or did she die from syncope? Why not give an intelligent account of the administration and effects of the agency, and of what was done to save the life of the patient? These grave offences should not be covered up. Death under such circumstances should not be winked at or the cause withheld from the public.—*D. & S. Microcosm.*]

PROFESSIONAL DIGNITY.—The relation of dentist to patient is peculiar, sometimes complex, occasionally embarrassing. Its tendency to the social, the sympathetic, and even to the pitiful, increases its delicacy, and whispers caution. Yet it is not difficult to an operator of sound mind and heart, and good common sense. If he is a true man, awkwardness will soon graduate to refinement; blunders to correct deportment, and embarrassment to ease. Experiment and a delicate discernment will tell him where to walk softly, when to use diplomacy, and how to produce trustfulness. But it is well for us all to keep in mind the difference between dignified familiarity and undignified intimacy. We must have an intuitive perception and an insinuating delicacy not developed in a coarse, vulgar nature. But where there is refinement there will be discretion that is pleasing, a delicacy of language and deportment that is winning, and a flow of wit, or of intelligence, or of society, that brings friendship, begets confidence and mitigates suffering.—*ED. Items of Interest.*

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ARTICLE I.

MICRO-ORGANISMS OF THE MOUTH.

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Read before the Vermont State Dental Society, March, 1892.

I have many times had the misfortune to be obliged to seek the aid of members of your profession, and the treatment I have sometimes been subjected to by them, while very generally resulting in my benefit, was of a very intense and extractive nature.

I never anticipated being especially called upon to attempt an elucidation of any subject having a direct bearing on the details and operative work, incident to the practice of your profession, and even an intelligent discourse on the theme of which I speak to-day, would, but a very few short years ago, have been practically impossible and excited but little interest.

But when a representative of your society, four or five

weeks ago, solicited of me a paper on "Bacteria of the Mouth," to be presented at the present session of your association, I consented to his proposition with pleasure, more especially as I had intended, shortly, to undertake some bacteriological investigations in this direction. I very much regret the limited amount of time I have had, in which to properly conduct many practical researches of some of the surprisingly numerous varieties of micro-organisms which either find their habitat in the oral cavity, or are simply resting strangers, or *loungeurs*, as I might say, in this locality. While I shall exhibit to you some flourishing so-called "pure cultures" of bacteria, whose ancestors were removed from carious teeth, inflamed gums, and improperly cleaned "grinders," I have, necessarily, been obliged to resort to the latest text-book on the subject, and to the various papers and articles which have recently appeared in medical and dental periodicals, both domestic and foreign, for the recognized varieties of germs infesting the mouth, their relatively respective frequency, etc.

To accomplish more than this, under the circumstances, was impossible, and the procuring of even the scanty material, which I shall present to you, exacted much more time and labor, than you might at first imagine.

It is an interesting fact in the history of bacteriology, that the first authenticated record and drawings of bacteria, were made from micro-organisms discovered in mucus from the human mouth by Leeuwenhock in 1683. From this time, until about 1860, but little progress was made in this subject, and the rapid strides, and the accumulation of important data accomplished in recent years, has been very largely due to the improvement and perfecting of optical instruments. The fortunate discovery, by Koch, and the use of artificial, solid, transparent food-media, was of scarcely secondary importance in the development of bacteriology,* by facilitating the separation, culture, and examination of germs.

*"Micro-organisms of Human Mouth."—MILLER.

A brief description of the more common culture media used for separating and growing organisms of the mouth, together with the methods employed in obtaining pure cultures will be of interest to those of you who are unfamiliar with the details of bacteriological investigations.

Nutrient Gelatine.—This is composed of beef juice or beef extract, to which is added from 3 per cent. to 20 per cent. of best French gelatine, 1-10 per cent. dried peptone, and 1-20 per cent. common salt. The reaction must be neutral, or very slightly alkaline. The addition of 1 per cent. to 2 per cent. of sugar improves the medium for the growth of mouth-bacteria.

This material is easily prepared,† and is largely employed, especially for plate or dish cultures. It is unfit for use in the incubator, as the gelatine is liquified at temperature above 25° C. The characteristic growth of many bacteria is better exhibited on this substance than on the following.

Nutrient Agar-agar.—This is prepared‡ similarly to the foregoing, only that 1 per cent. to 2 per cent. agar-agar is used, instead of the 5 per cent. to 20 per cent. of gelatine. (For detailed directions for the preparation of these media, reference to the text-books on Bacteriology is advised.)

Boiled Potato.—This is a very simple and valuable nutrient medium. Any sound potato can be used, excepting those which crack open, or become mealy, on boiling. The potato is carefully washed and scrubbed with a stiff brush (an ordinary nail-brush answers very well), and the "eyes," and any unsound portions, removed; it is then soaked for one hour in a 1:1000 bichloride of mercury solution, and finally boiled in a steam sterilizer, or cooking "steamer," for one-half or three-quarters of an hour. It is then placed in a moist chamber, or covered glass dish,

† It can be obtained already prepared by Elmer & Amend, 205, etc., Third Ave., New York.

‡ This can also be bought of the same firm.

which has been sterilized, and in the bottom of which has been placed a piece of filter, or blotting paper, slightly moistened with a 1 : 2,000 bichloride solution.

If the proper precautions have been observed in their preparation, potatoes thus treated will remain germ free indefinitely, and can be used at any time at a moment's notice, for the planting of material from which cultures are desired. Many bacteria exhibit their most characteristic growth on this medium, and but few germs are known which refuse to exist on it.

Occasionally a micro-organism is met with which requires for its full development a different soil from any of the three media just enumerated. In such cases other substances are used, such as sterilized blood serum, starch-paste, boiled hen's egg, etc.

Liquid media are also employed in the cultivation of micro-organisms generally, as well as those from the mouth, but more especially for studying the progress and phenomena of putrefaction, fermentation, decomposition, etc., occasioned by the action of bacteria. Such media are bread-juce, peptonized beef-bouillon (to which has been added 2 per cent. sugar, with, occasionally, the addition of starch,) urine, milk, watery extracts of various plants or grains, juice of fruits, saliva (to which some nutritious substances has been added), etc.

Pure cultures are obtained by transferring a minute quantity of a "colony" from a glass plate, or Petri dish, on the end of a sterilized platinum needle, to a tube of nutrient medium, where it is "planted" by either thrusting the needle directly through the centre of the solidified culture medium in a test-tube, then twisting the needle a few times between the thumb and fingers, and carefully withdrawing same, (the so-called "thrust," "puncture," or "stab" culture), or by drawing the point of the impregnated platinum needle, which has been slightly bent, across the surface of the medium, which has been allowed to solidify in the tubes, in an oblique direction (the so-called "streak" or "surface" culture.)

Considerable work and investigation in this line can be done by the practicing dentist, or physician, without investing in an expensive outfit; *at least* it is quite practical for any practitioner, who desires to determine the existence of any particular species of micro-organisms in certain cases, to *himself* inoculate a prepared tube of gelatine, or agar, with the suspected material, and send the same immediately to a bacteriologist for further treatment, examination, etc. The following is a procedure I have employed in the investigations of this subject, and is, as you will admit, exceedingly simple and quite satisfactory. I use the glass phials of various sizes, used by some wholesale drug houses for holding physicians' samples of pills, parvules, tablets, etc. These phials are sterilized, filled with from 1 to 2 ctm. sterilized gelatine, or agar, and their mouths closed with the ordinary cotton-wool plug. When a patient comes under treatment, having a lesion of the mouth, teeth, or gums, the bacteria of which it is desired to cultivate, the dentist sterilizes an excavator, by passing it back and forth through the flame of his spirit lamp, or Bunsen burner, a few times, and carefully removes a bit of material from the mouth and pushes it just into the gelatine in the prepared bottle. The same day, at the first opportunity, this is sent to me, and dish-cultures, etc., are subsequently made from the specimens.

To review *all* the varieties of bacteria which have thus far been described and obtained (over 100 species) from the buccal cavity, with their individual peculiarities, etc., would require several papers, each fully as long as the present one. I shall, therefore, confine myself to the consideration of a few of the more prominent and frequently occurring varieties, and afterward offer some comments, applicable, in a *general* way, to the subject.

It has been customary for many observers, to classify every thread-producing germ, which they find in the buccal cavity, as "*leptothrix buccalis*." This is to be deprecated, as there are several bacteria of the mouth which form threads.

The name "*leptothrix buccalis*" (like "bacterium terms"), designates no particular organism, possessing peculiar characteristics, and the name no more deserves to be retained than "denticola," "Buhlmann's fibres," etc.; the less so since it has always been the expression for an obscure and erroneous conception. Morphologically, as well as physiologically considered, *leptothrix buccalis* has been regarded as a veritable wonder. It has been said to perforate and split up teeth, its elements to cause all kinds of diseases in the oral cavity, to penetrate into the lungs, the stomach, and other parts of the body, and everywhere to manifest a destructive influence.

As absolutely nothing was known concerning the biology and pathogenesis of this organism, all sorts of wonderful properties were ascribed to it. It is therefore high time to banish this confusing name from bacteriological writings. (Miller.)

Miller suggests the name of *leptothrix innominata* for those germs of thread-like growth, whose biology is too ill understood, to place their relation to other mouth-bacteria.

Let us, for a moment, consider what the inducements are which the mouth, as a whole, offers to wandering, homeless "bugs," that they so readily and promptly enter these premises, and not only obtain their own individual livelihood, but, unceremoniously, at once proceed to increase the members of their households.

As pertinently stated by one observer,* the mouth forms "a kind of hot-house, or forcing ground, for their cultivation." Dr. Bergtold† says: "If one could find a perfectly sterile mouth, he could also see at once that the opportunities of seeding it, so to speak, are excellent, in that every individual is more or less constantly taking in air and also food and drink through that channel, and in both

* Woodhead—"Bacteria and Their Products," p. 537.

† "The Mouth as a Center of Infection," W. H. Bergtold, M. D., *Dental Cosmos*, Vol. 43, No. 2.

these actions receiving numberless spores and other forms which, later, gives us growth of bacteria.

The organic and inorganic substances found in the mouth, which may serve as nutriment for micro-organisms, are the following:*

1. Normal saliva;
2. Buccal mucus;
3. Dead epithelium;
4. Dental tissue softened by acids;
5. Exposed pulps;
6. Exudations of the gums, conditioned by the irritation of tartar, etc.;
7. Accumulation of particles of food.

The carbohydrates and albuminous substances furnish the greatest nutriment for bacteria in the mouth, and are almost constantly present there at all times. They are found between the teeth, in cavities in the teeth, and also upon their surface, and in any depressions.

Perfectly pure, mixed, human saliva has no toxic properties, and in those cases which have been reported by Pasteur, Valpian, Gautier and others, in which "unadulterated human saliva caused more or less morbid phenomena," it must be suspected that the samples used *were*, in some manner, contaminated.

Mixed with the various deposits of bacteria, etc., always present in the mouth, saliva may possess most energetic toxic properties, having many times proved fatal, even as abundantly proved by numerous recorded cases.

It is also probable that the saliva has far less anti-septic properties than is often ascribed to it, and the undisturbed growth of micro-organisms in the oral cavity, would seem to sufficiently support this view.

The diastatic action of the ptyalin of the saliva, in changing starch into a variety of sugar, variously termed

* "Micro-organism of the Human Mouth," Miller, p. 37.

dextrose, maltrose, or ptyalose, which, as soon as formed produces an excellent culture-medium for those germs concerned in the process of fermentation.

According to Miller,[†] there are six different micro-organisms which are almost invariably present in every mouth. They are:

1. *Leptothrix innominata*. This occurs as thin, more or less zig-zig threads. Found in the soft white deposit on teeth in every mouth. Is stained faint yellow by a solution of iodine in iodide of potassium sol., slightly acidulated with lactic acid.

2. *Bacillus buccalis maximus*. Occurs as isolated bacilli, or threads, more often as "tufts of threads." Is the largest of mouth bacteria. Is stained brownish-blue more or less deeply, with iodine solution.

3. *Leptothrix buccalis maxima*. This occurs as long, thick, straight or curved filaments, somewhat similar to bacillus buccalis maximus. Is found on the mucus deposit upon the teeth. Is not stained by the iodine solution.

4. *Jodococcus vaginatus*. Occurs singly or in chains of from four to ten cells. Chains have a sheath, and cells appear as flat disks, or as more rounded, even squares. Occurs in all unclean mouths. Not stained with the iodine sol.

5. *Spirillum sputigenum*. This is seen as rods, curved like commas, having very active, spiral movements. Found in all mouths, especially in unclean ones. Is the soft deposit on the margin of inflamed gums of dirty mouths. Stains more readily than the foregoing.

6. *Spirochacte dentium* (denticola. Found as spirals of very irregular windings and unequal thickness. It is found under the margins of the gums, when covered with a dirty deposit and slightly inflamed, or in other words, gingivitis marginalis.

[†] "Micro-organisms of the Human Mouth," Miller, p. 60.

There are a great many mouth bacteria proper, not *invariably* found in *every* mouth, which are uncultivable and whose pathogenesis is unknown. Among them Miller found a bacterium of enormous dimensions, in the mouth of a dog suffering from pyorrhœa alveolaris, which he has called leptothrix gigantea. There are also three or four kinds of germs from the mouth which give a blue, or violet reaction with iodine, and from twenty to forty varieties which are cultivable, partly non-pathogenic, partly of unknown pathogenesis. The oral cavity is a favorite locality for many varieties of chromogenic or color-producing bacteria. These are widely diffused in nature, and occur abundantly in water, in the air, and various places.

In the mouth they are less numerous than the colorless germs, and probably on account of this preponderance, the color is not visible when in this locality, but is readily developed during the culture of these micro-organisms on many of our culture media.

Among the colors produced by different species of the mouth bacteria, Miller, gives a yellow, produced by at least eight kinds of bacteria: *green*, (by 5), *red*, or reddish (by 3), *blue*, *black*, *brown*, *orange*, etc.

To study any of the bacteria, particles of matter containing them must be taken from the mouth, and mounted directly on covered glass, after which they may be examined fresh and unstained, or (after being carried through the flame of a Bunsen burner or spirit lamp *three times*) be stained and mounted permanently.

Many of the germs that have been found in the oral cavity are, of course, accidentally present, having been deposited just previous to an examination, which would only remain a short period.

The micro-organisms I have just mentioned, as being termed "Mouth Bacteria Proper" by Miller, are found in *all healthy* conditions of the cavity, but the variety and number is more or less greatly augmented when any morbid condition whatever occurs, such as inflamed gums,

wounds, etc., of the mucous membrane of the mouth, dental caries and ulcerations, etc. Of these Miller found, by inoculation experiments on mice, rabbits and guinea pigs, many germs, the inoculation with which produced either death, or a pathological condition of the animals thus treated. These he calls "*Pathogenic Mouth Bacteria*." Of the varieties separated, the following were studied more in detail:

1. *Microoccus gingivæ pyogenes*;
2. *Bacterium gingivæ pyogenes*;
3. *Bacillus dentalis viridans*;
4. *Bacillus pulpæ pyogenes*.

The first of these micro-organisms, *mic. ging. pyog.*, was found several times in a case of pyorrhœa alveolaris, in the deposit around the teeth of a very filthy mouth.

The second, *bact. ging. pyog.* was found in the same mouth as the foregoing, and also in a suppurating tooth-pulp of a second person.

Bact. dent. virid., the third variety, was found in the superficial layers of carious dentine. In cultivation upon gelatine this bacterium produces a beautiful opalescent green coloring matter which it imparts to the gelatine.

The fourth bacterium, *bact. pulp. pyog.*, was found in gangrenous tooth-pulp. The inoculating materials used, were pure cultures of the different germs, mixed cultures and gangrenous pulps, and the inoculations were made into pockets beneath the skin of the animals and by subcutaneous injections, and injections into the abdominal and thoracic cavities. The pockets were made as usual, at the root of the tail, and the injections with sterilized syringes.

Before giving the results of these inoculations, let us see what are the conditions necessary to be fulfilled, in order to establish unrefutable proof of the pathogenic nature of any given bacterium. According to Koch, a micro-organism must comply with the following requisitions, before its pathogenic character is determined, the so-called "*Koch's laws, or rules*:"

First—It must be proved to be present in all cases of the disease in question.

Second—It must further be present in this disease and in no other, since otherwise it could not produce a specific definite action.

Third—A specific micro-organism must occur in such quantities, and be so distributed within the tissues that all the symptoms of the disease may be clearly attributable to it.

Fourth—After removal from the body of an affected animal, and its growth in pure culture, the inoculation of the latter into susceptible animals, must produce the disease in question.

Miller's inoculation were followed by either local redness and swelling, abscesses, suppuration and gangrene of adjacent tissues, or blood poisoning, and in many cases by death from septicæmia peritonitis, pleuritis, etc.

Inoculations with mixed cultures proved more dangerous than when pure cultures were used, and still more effective when gangrenous pulps were used than with mixed cultures.

The diseases caused by the pathogenic bacteria of the mouth Miller considers under six heads, according to the point of entrance of the infection :

1. Infections caused by a breach in the continuity of the mucous membrane, brought about by mechanical injuries, (wounds, extractions, etc.). These lead, either to local or to general disturbances.

2. Infections through the medium of gangrenous tooth-pulps. These usually lead to the formation of abscesses at the point of infection (*abscessus apicalis*), but also sometimes to secondary septicæmia and pyæmia with fatal termination.

3. Disturbances conditioned by the resorption of . poisonous waste products, formed by bacteria.

4. Pulmonary diseases caused by the inspiration of particles of slime, small pieces of tartar, etc., containing bacteria.

5. Excessive fermentative processes, and other complaints of the digestive tract, caused by the continual swallowing of microbes and their poisonous products.

6. Infections of the intact soft tissues of the oral and pharyngeal cavities, whose power of resistance has been impaired by debilitating diseases, machanical irritations, etc.

7. Possible infections by the accumulations of the excitants of diphtheria, typhus, syphilis, tuberculosis, etc.

DENTAL CARIES.

It has been proven, beyond doubt, that decay of the teeth is caused by two different processes, namely: (a) chemical, (b) parasitical.

The first is a decalcification of the enamel, or dentine, or both, caused by the presence of acids in the mouth, which have been formed from the fermentation of starch and saccharine substances, resulting in a softening of these tissues, after which these latter form an excellent food-medium for many varieties of bacteria.

The prevention of dental caries depends, first of all, on strict cleanliness of the mouth, the importance of which can not possibly be over-estimated, the details necessary for the proper fulfillment of the same would be superfluous for me to suggest to you. Undoubtedly, good stiff tooth brushes and plenty of clean water stand at the head of all measures of this nature. The next prophylactic means is the intelligent use of proper antiseptics.

By far the most perfect germicide known, that can be at all employed in this connection, is the bichloride of mercury, but the use of this substance is not without danger. It should not be used as a wash for the mouth in solutions of greater strength than 1 to 2,000. and even then care must be exercised in its application. Other antiseptics which have been recommended for the oral cavity are salicylic acid, strength of 1:200, or 1:350 listerine, wintergreen oil, and like aromatic substances are suggested.

In this connection might be noted the germicidal properties of tobacco, either the juice of the leaf or the smoke of the burning leaves. Certain it is, from results obtained by many experiments and observations, that tobacco-juice, or smoke, very speedily destroys bacterial life, but I would not, on this account, advocate its use, as the evil results of excessive indulgence in the "weed" more than counterbalance any possible benefits resulting from its antiseptic action on micro-organisms of the mouth.

In discussing the subject of infection, attention should be directed to the danger which exists from the spread of infectious forms of bacteria that are liable to be present in the mouth in various directions. It is not difficult, under certain circumstances, to excite an inflammatory process in the middle ear, the transmission of septic germs taking place through the eustachian tubes; similar results may also occur from pyogenic bacteria being carried from the mouth to the throat, lungs, parotid gland, antrum, and even to the brain, as stated by Bergtold.

When it is considered that of all diseases of a parasitic nature to which mankind is susceptible, dental caries is by far the most frequent, the possibilities, I have just mentioned, can not be charged as being the improbable and unlikely speculation set forth by one who is "cranky" on the subject.

Upon reviewing the various literature on this question, especially those portions of it which refer to the dangers of infection between the dentist and his patient, the speaker was much surprised to find no advice offered to the dental profession by competent bacteriologists, as to the considerable (and oft-times *great*) danger present, to the patient, by pathological conditions the dentist *himself* may be suffering from at the time of operating, and to point out the necessity of establishing, by legislative measures if required, laws, or statutes, which would prevent the occurrence of such dangers.

I refer more particularly to the jeopardy in which

human life is placed, when people are subjected to treatment by a practicing, *tubercular* dentist. This may seem, to many of you, as a bit of superfluous advice, and you may retort that such a circumstance is beyond the bounds of possibility, but I assure you, *I have seen a tubercular member of your profession practicing daily on unsuspecting, or ignorant, and innocent patients.*

My experience with dentists has been very limited, and therefore, I am not in a position to make any assertions as to the frequency of such pernicious and dangerous proceedings; but the very fact that my slight personal observations resulted in the detection of *one* such case naturally suggests a possible more common occurrence of tuberculosis in practicing dentists than might be supposed. Since commencing the work incident to the preparation of this paper, one of the local members of your profession has detailed another case, which was under his own personal observation, of a "TUBERCULAR PRACTICING DENTIST."

The *greatest* danger, under such circumstances, *is not*, as some of you might imagine, in the infection of the patient by the transmission of the germs through the medium of the breath of the operator, but in the reception of tubercular material, which becomes dry on the handkerchief, clothing, linen, or instruments of the dentist. The prevention of such desiccation is so extremely difficult and impracticable as to be discarded without serious consideration, if such (prevention) be presented as a possible prophylactic measure, to enable the victim of this malady to continue his professional work until physically unable to do so on account of the inroads of the disease.

It is not generally known that bacteria do not float in the atmosphere in the moist state, but only do so after desiccation, and then probably to no great extent, unless aided by more or less strong currents of air.

Tuberculosis is now almost universally considered to be an infectious disease, and of so contagious a nature that

I candidly believe, we shall, many of us, see the day when attention to preventive measures against possible infection from cases of this disease is as regularly insisted upon as are the sanitary requirements in cases of small-pox, yellow fever and typhus fever (with the exception of somewhat less vigorous quarantining) at the present day. The period in which to accomplish this much desired treatment of tubercular cases will depend upon the rapidity with which the laity, and *professional men* even, become educated to the full comprehension of the single and *sole* cause of the affection, the tubercle bacillus, and the proper realization of the benefits to be derived from the adoption of such measures. And to the intelligent efforts and advice of the members of the medical profession, as well as to the great aid which *you*, members of the dental profession can give by embracing each and every opportunity to inform your patients, especially influential citizens, as to the true character of tuberculosis, must the accomplishment of this end very largely devolve.

Of all the various ways by which tubercle bacilli find entrance into the human body (such as from the surface of the skin through wounds, by contusions, cuts, or otherwise; from the ingestion of milk and flesh from tubercular cows and animals, etc.), infection by inspiration—by the entrance of the dried germs through the mouth, and so on to the lungs—far surpasses in frequency all other methods of transmission. And this can only be accomplished when the medium on which the micro-organisms have been discharged from the body dries, or disintegrates into powder or dust. For this reason the most dangerous source of infection is from handkerchiefs, or cloths on which the sputum has been received (unfortunately a too common procedure) and on which it becomes dry in an exceedingly short time. Consequently by merely preventing the sputum of phthisical persons from drying the most important kind of infectious matter may be rendered harmless.

The first contradiction I have seen by competent pathologists (who acknowledge the tubercle bacillus as the essential cause of tuberculosis) to the statement that the *commonest* source of infection is the inhalation of dried bacilli from handkerchiefs, linen, clothing, dust from the floors and ceilings of rooms previously occupied by tubercular subjects, etc., was recently made by Dr. J. West Roosevelt, of New York.*

Dr. Roosevelt maintained "that there was much more likelihood of getting an over-dose of the virulent germs" (of tuberculosis) "through the alimentary tract, either by the ingestion of meat, milk, or in children, by putting articles of every nature into their mouths, no matter where they have lain," than by the manner which I have just described. While recognizing the value of the opinion of so able an authority as Dr. Roosevelt, I am convinced that his statement will not be corroborated by the majority of pathologists and bacteriologists in this country, or on the continent. True it is that much needless alarm may be created in the minds of the public by the advocacy of too severe and unnecessary measures of prevention, such as quarantining, etc, by prejudiced and over-zealous investigators, the effect of which would be the unjustifiable persecution of many poor victims of tuberculosis, and as I just suggested, the *only proper* course to pursue in dealing with this question is by persistently and intelligently educating the minds of the public as to the *exact* status of this matter.

Few pathologists at the present day believe in the theory of heredity as a cause of tuberculosis. But it is a fact that the off-spring of consumptive parents, especially where the mother is affected, often develop sooner or later the disease, but the explanation is to be sought in a general impoverished condition of the organism, as in-

* New York Academy of Medicine, Feb. 4, 1892; vide Medical Record, Vol. 41, No. 10.

dedicated by enfeebled assimilative and nutrient powers, which are quite sure to follow as the inheritance from unhealthy progenitors.

What I have just said in regard to transmission naturally leads to the most interesting and important problem in bacteriology, namely, that of *immunity*; and I ask your indulgence for a few moments in order to state the theories at this time held in regard to this subject.

As you are probably all aware two principal views are advanced to account for the difference of susceptibility possessed by different animals to the same micro-organism, and also that exhibited by the *same* animal to *different* germs.

I might state here that immunity is of two principal kinds, to wit: (a) *natural*, or "in-born;" (b) *acquired*, or "artificial."

The first of the theories of *natural* immunity is based on the *chemical* germicide properties of the blood-serum and tissue-juices of the body.

The second, or "*Metschnikoff's*" theory attributes the resisting power which an individual or animal may possess to the so-called "*phagocytic*" action of the tissue-cells of the body, more especially the colorless corpuscles, or leucocytes of the blood.

Metschnikoff believes the presence or absence of immunity depends on the ability or inability of the cells of the body to devour and destroy the bacteria. Such ability may be natural or acquired. In the latter case the cells, where they have once had the opportunity of devouring attenuated micro-organisms with a milder poison, which nature enables them to withstand, are so far accustomed to it that they can devour the most virulent material with impunity. This can be effected both by gradual adaptation, and also by a kind of selection in which only the strongest, most vigorous cells remain and transmit the acquired faculty to their descendants. The leucocytes are but short-lived cells. A permanent resistance of the

organism to a disease which it has once had, or against which it has been protected by inoculation is, therefore, only conceivable if we grant to the cells the power of transmitting an acquired property unaltered to their children and their children's children. This hypothesis, as must have been seen, presupposes an extraordinary docility in the protoplasm of the white blood-corpuscles, to which it attributes something like feeling, thinking and acting, a sort of mental perception. But if we raise no objection to this, there remain plenty of reasons for combating the phagocytic theory as immunity.

In our opinion, the fact that it is essentially the excretions of the bacteria which produce, or are able to produce immunity, is difficult to harmonize with Metschnikoff's hypothesis, for if no living micro-organisms are present none can be devoured to accustom the cells to the poison and prepare the way for resisting more virulent successors. To overcome this difficulty it would be necessary to suppose that the reception of attenuated germs acts upon the cells only as a specific stimulant, to which they answer by a functional reaction, and that this stimulating power exists in the same degree, and works in the same manner, also, in the bacterial products. The theory of the germicidal action of the blood-serum, or plasma is, I believe, supported by more weighty authority than is the ingenious one of Metschnikoff.

I have thus forsaken the exact theme of my discourse from a belief that more benefit would be derived from the brief treatment of a subject, at best only partly understood by the highest authorities in this branch, but which one who has devoted much time in practical investigations must, necessarily, be better qualified to handle than the average practitioner.

Would the time (and, perhaps, your forbearance also) admit, much profit might be had from the further discussion of bacteria of the mouth, but the vast extent of the subject renders anything but a superficial consideration of it impossible.

As yet, we are only on the *frontier* of the domain of bacteriology, and have only obtained a comparatively few facts, or details, of this most interesting and important kingdom.

What data and facts, investigations into the interior of this boundless area of unexplored territory of micro-organic life, will place us in possession of, time, perseverance and unremitting efforts will prove.

We certainly have reason to believe that the knowledge of such points, at present undiscovered, together with their practical application, will be of inestimable value to mankind.

In closing, allow me to express my gratification for your kind invitation to participate in the proceedings of your valuable and flourishing society, and to thank you sincerely for the close and courteous attention accorded to me to-day, and further, to record my obligations to one of your individual members, Dr. Hodge, who has rendered me every assistance possible in the collection of material for and in the preparation of this paper.—*Microcosm*.

ARTICLE II.

THE TREATMENT OF THE IRREGULARITIES
OF THE TEETH.

BY EUGENE S. TALBOT, M. D., D. D. S., CHICAGO, ILL.

Read before the annual meeting of the Dental Society of the
State of New York, May 11, 1892.

In the preparation of a paper upon this subject for a meeting like this, it is difficult to decide what to say and what not to say, because it covers so much ground. What I shall say however, will be upon phases that I hope will draw out discussion.

According to a well-known authority,* one of the earliest writers to mention treatment of irregularities of the teeth was Egenolff, in 1541. To show the vast stride of advance made since then, I will quote from the translation of his pamphlet: "It often happens that to children more than seven years of age, when the teeth begin to drop out, other teeth grow by the side of those which are about to fall out; therefore we should loosen the tooth about falling out from the gums, and move it often to and fro until it can be taken out, and then push the new one every day toward the place where the first one was, until it sets there and fits among the others; for if you neglect to attend to this the old teeth will remain, become black, and the young one will be impeded from growing straight and can no more be pushed to its right place."

It is evident from these remarks that it is only within the last three hundred years that much thought has been given to this subject, and that the slight knowledge of treatment for irregularities at that time and for some time subsequently was of a prophylactic nature; that is, it was confined entirely to the management of the teeth of the first set, with the view of proper eruption of the second set. Evidently only such irregularities as were being caused by the deciduous teeth were regarded as within the power of man to correct. Could it be that there were not as many such cases then as now? I have examined large collections of old skulls in Europe and America, and found no V or saddle arches, or any variations of them. It would seem that this is an indication that perhaps these forms of irregularities are of comparatively modern origin.

In previous papers I have shown that irregularities of the teeth are now on the increase. I have also shown that there seems to be no plan by which this increase can be checked, unless it be the care of children's teeth and the observance of common sense rules regarding extraction of the adult teeth.

*Farrar's Treatise on Irregularities.

While dentistry has been practiced in this country for more than a century, I have been unable to find a single mention of the correction of any of the constitutional forms of irregularities prior to the year 1859, at which time mention was made by Dr. Westcott in an article upon the subject of what he denominated "Expansion of the Upper Dental Arch." * Brief mention had been made of the cause of these deformities, however, as early as 1825.† This shows that while the very able practitioners at that period were well versed in theories and the plans of operations then in vogue, they had written little and accomplished less in the line of invention of mechanisms for the correction of such deformities. In this alone, may we not see some evidence that aberrations in the jaws and teeth were then uncommon, or else that they were regarded as impossible to correct? Since that time, however, we know that knowledge of treatment for correction of irregularities has increased rapidly, and that it has now become a specialty.

The subject of irregularities of the teeth and their correction is a branch of surgery that requires special attention, special education, special training. In 1878, Dr. Farrar, feeling that the importance of this branch of dentistry was not appreciated, made considerable effort to show that it should be taught to greater extent in our professional schools. Indeed, he tried to urge upon some of the members of the faculties of two or three colleges the matter of establishing a special chair upon the branch, but at the time no one except himself appeared to feel that there was sufficient to the subject of irregularities of the teeth and their correction to warrant any such effort. Since that time a great change has taken place in professional opinion; so great is this change that I believe that if the time has not already come, it is not far off when every first class dental college will have such a chair.

* Dental Cosmos, September, 1859; American Journal.

† See "Irregularities of the Teeth," (Talbot).

I have frequently observed cases that were disfigured and ruined for life, by incompetency. Probably many persons present have seen similar cases. Three cases that were mismanaged have come under my care during the past twelve months; the first one a woman of fine appearance, who had lost her upper lateral incisors and called upon a dentist for treatment. He attempted to draw the cuspids into close proximity to the central incisor. The woman had given her entire vacation and all her money for this operation, and then it was only partially successful. That such an operation was wrong needs but little argument. The expression of the mouth was pointed, and the features were otherwise distorted. Had a small plate bearing lateral incisors been inserted in the space, instead of having had the cuspids moved, the facial expression would have been improved instead of injured.

Case No. 2 is that of a young man with what seemed at first and what an old practitioner had regarded as a "prognathous lower maxilla." This I found upon inspection to be caused by arrested development of the upper maxilla. This dentist had spent five years in trying to reduce the deformity. It was fortunate, however, that he was unsuccessful, for had he succeeded the deformity would have been made greater than it was. Instead of moving the lower teeth back, the upper teeth should have been moved forward. In six months' treatment by this plan, the teeth were correct and the face greatly improved.

The third case was one that occurred in my early practice. To make room for the anterior teeth to be carried backward, I extracted a tooth upon one side only. The result was that the incisors moved around to that side, causing an unsightly appearance. Fortunately, however, I have been able to correct this condition by extracting one on the other side. These mistakes are frequently made by dentists. Of course, I do not wish it inferred that two teeth should be taken in all cases. As

one author* suggests, "the relation of the line between the centrals to the median line of the face should determine in the main the question as to whether one or two teeth should be extracted, because sometimes the centrals are at a considerable distance to one side of their proper place. The nose is generally the best guide for determining this esthetic question, the exceptions being when the nose is at one side of the median line of the face. Even then the septum of the nose should influence this matter, as well as the median line of the face."

From these cases, as samples of many, we see that to correct irregularities of the teeth we should have a broad knowledge of the human body. It is not sufficient that a dentist understands mechanics and physics; he should have considerable knowledge of high art. In truth, the specialist should be what may be called a scientific man,—well read in evolution, anthropology, ethnology, as well as in anatomy of the human face. No dentist ever lived whose intellect was too great or whose education was too extensive for the profession of dentistry. Of course he should understand physiology, pathology, and especially the subject of absorption and deposition of new matter, and the influence that the condition of the patient has upon these two processes, and also the unfavorable results that may arise from too much irritation from moving the teeth too rapidly. He should also have the kind of education that will enable him to observe any derangement of the system that may result from strain,—a result that is especially liable to occur in delicate children at an age when teeth can be moved most easily. Such knowledge will better enable him to discover the cause of the deformity, and in many cases aid him in deciding the kind of treatment that will best correct that deformity. Not long ago I heard of a young lady being confined to her house, and part of the time to her bed, for two years, as a

* J. N. Farrar.

result of having her teeth regulated. This case was treated by a dentist who thinks it is not necessary to know anything about general medicine in order to practice dentistry, and he is a teacher, too.

Irregularities of the teeth cannot always be prevented. There are, however, two causes of irregularity that might be prevented, that which results from lack of proper care of the deciduous teeth, and that from extraction of the first adult molars. I regard these two sources as great causes of arrest of development of the jaws. I mean the alveolar ridges and the dental arches. We are all aware that the deciduous teeth generally decay early, and that they are frequently extracted long before the proper time. Some dentists do not feel the importance of preserving the deciduous teeth until they are to be soon replaced by their successors. The object of preserving deciduous teeth is to prevent the second teeth from erupting upon their territory. Especially is this true of the first adult molars, which, if not prevented from moving forward, will encroach upon the space necessary for the second bicuspid.

It has been the practice with some dentists to teach pupils that it is proper to extract these first molars, because "the jaw is crowded;" that "by the extraction of these four teeth, room will be made for the remainder to appear in line." One dentist said that his father invariably removed these teeth for the purpose of preventing irregularities, and that it would be impossible to find a single person over seven years of age in his neighborhood that could show a first "permanent" molar. I think that the habit of extracting the first adult molars during the past forty years has done more to cause arrest of development of the alveolar ridge than any other thing.

In reply to a letter written to a dentist in Glasgow, requesting him to "measure the distance from one first molar across the arch to the opposite molar," he said that if he tried he would not be able to find three hundred adults in his whole country who would have their first

molars. Another dentist of many years' experience has lately published in this country an article advocating the extraction of these first molars as a means of prevention of irregularities of the teeth. Thus it will be seen that even in this late day the followers of this pernicious habit still exist.

In a few cases such extraction might be beneficial, but generally it must lead to disastrous results. I regard these first molars as fixed bases in the dental arch, and that the position of the other teeth depends much upon them for forcing the teeth and alveolar process outward and forward to the proper line. The effect of the constant habit of extracting these adult molars in a family is arrest of development of the alveolar process, which in time, I think, will cause inherited smallness of the jaws.

The extraction of these teeth sometimes causes another kind of irregularity, which, though not unsightly when the jaw is seen independent of its mate, is sometimes, so far as the utility of the teeth is concerned, more disastrous. I allude not only to the inclining forward of the second molar and an inclining backward of the bicuspid, but of the contraction of the dental arch, so that it not only impairs the antagonism, but destroys it almost entirely. I have seen cases, as probably most of you have, in which the extraction of the upper first molars has caused the remaining teeth to form an arch as small as to occlude inside of the lower arch, leaving no teeth to antagonize except the corners of the extreme posterior molars.*

The space required to correct an irregularity is never so large as that made by the extraction of the two first molars, and seldom is it necessary to have more space than can be obtained by the extraction of one bicuspid on each side. As these latter teeth are generally situated

* Some of the bad results of extracting these teeth are well shown in a recent paper by Dr. Davenport in the "Dental Cosmos."

nearer the point of the greatest degree of irregularity, the operation is often facilitated by their extraction. Of course I do not advocate extraction of bicuspid, or any other teeth in all cases of overcrowding, but when it is necessary to extract side teeth at all, I prefer as suggested by one authority, to extract a sound bicuspid rather than a first adult molar, even though the latter should be considerably decayed.

In a paper upon the subject of "The Differentiation of Anterior Protrusions of the Upper Maxilla and Teeth," read before the last International Medical Congress, I explained how the different varieties of protruding teeth were caused, and remarked that if these lesions are thoroughly understood by the operator, it will enable him to correct them easier than if he does not understand them. For illustration, protrusions caused by arrest of development, or those from socket disease, are easier to reduce than those protrusions caused by deposition of bone cells, such for instance, as are illustrated in Dr. Kingsley's work, page 131.* In the first mentioned varieties we have simply normal alveolar process to resorb by the application of pressure upon the teeth. But in a patient twelve years of age, with the lower incisors antagonizing with the gums in the anterior part of the vault of the mouth, the result of long teeth or of excessive height of the alveolar ridge, the upper incisors protrude between the lips at an angle of 45 degrees. We have an alveolar process as dense and hard as true bone, and the pressure required to move the teeth must be several times greater, often greater than can be obtained from any anchorage that can be made in the mouth.

APPARATUS.—Special plans of treatment have been advanced by dentists, and special kinds of apparatus have been invented and put forward in the market for general

* "Oral Deformities" These cases are also referred to in my work, page 161.

use, but it is rare to find one of these that will serve for more than one case, even though it be of the same class, without considerable alteration or without being all made over. Many practitioners of dentistry have been misled by advertisements of these goods. They read well, but they are a delusion and a snare. I think that those devices which are recommended for reducing anterior deformities caused by arrest of development of the maxillæ should be used with caution, or else the incisors and cuspids, instead of being moved backward, will stand still, and the anchor teeth (the bicuspid and molars) move forward. One author,[†] however, in his work shows to what extent the side teeth are useful to anchorage, and also points out when to resort to the head-gear. In my hands the only satisfactory appliance in all cases is the skull-cap of Fox, making the back of the head anchorage.

The degree of difficulty in such cases depends somewhat upon the shape and thickness of the alveolar process, height of vault, and the age of the patient.

It may be claimed that the devices on the market are only approximate in form; that the operator is expected to make alterations before putting them into use. But often it would require more skill to alter such ready made mechanism than it would to invent and construct new cases. No matter how well he may understand the cause of a deformity and the device which is necessary to correct the case, unless he knows how to construct apparatus so that it will meet the needs of each case, he will be liable to fail as a regulator. Frequently dentists send me models and ask for opinions as to the best plan of correcting the cases. They often also call for the mechanism for correcting them. My plan of reply is to return the models and refer the senders to certain well known forms of apparatus, naming them in the order which they should be considered. If one will not meet the demands of the

[†] J. N. Farrar.

case, another can be studied. I purposely refrain from speaking upon any special plans of treatment, unless I can have the opportunity to personally study the mouth and face.

- During the past ten years special devices have been urged, through private and public clinics, upon the profession by different operators, as special "systems" of practice. As a proof of the value of their "systems," they show cases in plaster which at first glance appear to show favorable results, but to an expert many of them show unfavorable results. The profession has but to examine the illustrations in some of our monthly journals to find such failures. Some of these things have even been patented, not for protection of the profession, but for making money out of dentists. If these things, some of which are old to the profession, were practicable when bought, there would be some redeeming feature in the business. I have tried all that are on the market, with one exception, and I have not yet found one case for which I could not devise something different that would accomplish the work more easily and with better results. The exception referred to is a device that would be worthless for any case. Show me a dentist who tries to regulate all cases with one piece of apparatus, or one set of them, and I will show you an unsuccessful practitioner. Do not misunderstand me. Most mechanisms made for sale may have accomplished the desired results in the cases for which they were devised, but the assertion that they will meet the needs of all similar cases I think is unsound. I believe that every one who has had experience with them will say that "they have been tried and found wanting." Many operators, including myself, who have been deluded by these advertisements, have sometimes not only been disappointed in the thing itself, but have been drawn into embarrassing positions with patients.

I have already alluded to such a case in the treatment of anterior protrusions, when the posterior teeth have

been carried forward instead of the anterior teeth being carried backward.

The treatment for correction of irregularities should be like that of true medicine. It should not restrict itself to any one thing or any one plan, but selected from all things and from all plans that have proven efficient. It may, of course, require sound judgment to select that which is the best for a case, but that does not prove anything unsound in my remark.

Every operator in this branch of dentistry should have large resources at his command from which to select the best materials for regulating mechanisms for any given case, because there is no panacea.

To Dr. Norman W. Kingsley, in 1880, is due the credit of introducing several effective devices, and credit for bringing together in a section of his valuable work (principally devoted to other subjects) much of that which was then known upon the subject of irregularities. Since the issue of this book another work on the science and art of the treatment of the irregularities of the teeth has been published by a different author. This reflects great honor upon the dental profession, not only by the vastness of the work, but because the author has handled the various phases of the different subjects in a highly scientific way and in a catholic spirit. The volume is so well systematized that any dentist referring to it can find information on almost every conceivable point, and also find illustrated almost every valuable mechanism that has ever been used for the correction of any kind of a case or class of cases. At the risk of being regarded as enthusiastic, I will say that this encyclopedia—for that is what it really is—will always stand out in bold relief as one of the few grandest blossoms of the dental profession, and as a product developed in our generation we should be proud of it. To say in Dr. Kingsley's words that Dr. Farrar's book "is the most elaborate and exhaustive work of its kind," is not too great an encomium.

At the present day I think the dentists should discard clumsy plates whenever it is possible, and I think it probable that in the near future, as has been demonstrated in the past fifteen years by some of the ablest specialists in this branch, nearly all irregularities, including the most difficult forms, will be treated with skeleton mechanisms consisting of clamp-bands, ferrules, levers, gold ribbons, gold and steel screws, and rubber and wire springs. Plates, however, have their uses, and are sometimes absolutely necessary to success, but when plates are called for they should be as light and small as possible consistent with effectiveness.

From the time that the first treatments for correction of teeth were reported by different dentists, up to about the year 1876, all or nearly all mechanisms consisted of plates and narrow strips of sheet gold, or silver, placed along the dental arch, and the teeth were connected with them by strings or rubber rings. The plates as then made were cumbersome, filthy, and the strings tied on the teeth cut deeply into the gums, causing irritation, inflammation, and pain.

To Dr. W. H. Dwinelle, of New York City, is due the credit of making in 1849 one of the greatest advancements in the treatment of widening the dental arch, the use of the screw-jack. This was made of steel. It reminded for Dr. Farrar, however, to substitute steel screw-jacks by gold screw jacks, and to make and develop numerous plans for using screws in other ways as aids in causing continued as well as intermittent force, with the least harm possible to the tissues. In 1866 the introduction of steel piano wire in combination with plates, invented by P. Headridge, of England, and two years later developed by the elder Coffin and his son, was another stride in advance over earlier plans of using springs; but in Dr. Farrar's combination of springs with screw-clamp bands for anchors, we have devices that are superior.

Wire, from its electricity and quality, enabling it to

be bent in any desirable form, is available for use in many conditions of irregularities not before thought possible by anything. The use of clamp bands does away with clumsy plate anchors. For the best interests of patients of nearly or quite full growth, I have become convinced that when it is practicable to apply intermittent acting apparatus, it is by far the best. But there are many cases for which screws are not practicable, and wire springs and elastic rubber are better, and, strange as it may seem to some of you, for more than a hundred of this class of devices we are indebted to Dr. Farrar's ingenuity.

A very simple little device which I use constantly, and by which I reduce many abnormalities, is made of German silver rolled (Nos. 24-26 and 28, U. S. gauge) and cut into strips, and then bent in and out between the teeth; the ends being shortened every day. This device can be used between any of the teeth including the bicuspid and molars.

Considerable was said years ago about "jumping the bite," as it is called, and a number of articles have appeared this past winter in the dental journals in which this subject has been revived. As I understand this phrase, it consists in throwing the lower jaw forward one-half the width of a bicuspid, thus bringing the lower incisor closer to the posterior surfaces of the upper incisors, and also causing the chin to become more prominent. In a case like this one or two conditions exist: either the upper jaw has developed beyond its normal position, or the lower jaw is arrested in its development. The latter is most likely the case in a large majority of cases. In either case the articulation at the joint is in a normal condition. I have never been able to "jump the bite," although I have tried it in a number of cases. I do not believe anyone else has been able to accomplish it, nor do I believe such a thing is possible. Were such a thing possible, one of two things must take place. First, absorption and deposition and deposition of bone cells must take

place at the weakest part of the jaw, namely, at the angle, to allow of the forward movement, which is out of the question, for two reasons: First, there is not pressure enough; and second, if it could take place, the articulation of the teeth would be spoiled. Second, there must be a forward movement by absorption of the condyle in the glenoid cavity of the same amount of space to correspond to the forward movement of the teeth, which is out of the question for three reasons: First, there is not pressure enough to produce the absorption; second, tissue in front of the cavity would become involved, and third, nature would not construct a new cavity to accommodate the condyle.

FEES.—No one thing has a tendency to degrade this branch more than the plan of making fees for the operation. It is the custom with some dentists to examine a case and then make an estimate upon the operation, just as a carpenter estimates the cost of making a door or a window. In the latter case the carpenter knows what he is figuring upon, and therefore is sure to make a profit by his contract. On the other hand, the dentist may not be able to forejudge in regard to the extent of work necessary to complete an operation (because he has no means by which he may calculate upon the idiosyncrasies of his patients), therefore a set fee is an uncertain remuneration. If he values his time on the same basis as for other operations, the results are often too small. Frequently the operator is satisfied with small compensation, arguing that his time would not be otherwise used. This argument, of course, applies only to those who have a limited practice. A large proportion of the dentists practice their calling as if it were a trade, rather than as a profession. In no other department of surgery would the operator be satisfied with the fee for the time spent, as does the average dentist on regulating cases.

The method of a prominent Boston dentist is as follows: After taking the impression, a time is set for the

next visit. This gives the operator an opportunity to study the case, as well as to inform himself as to the responsibility of the patient. When the patient returns a contract is agreed upon, and the basis is, say, one, two or three dollars per visit, and one, two, five, or ten dollars for each device used, the price being governed partly by the nature of the appliance to be made. The operator should never commit himself as to the nature of the devices to be used or to the length of time required for completion of the operation, for it may be necessary to change the device or plans of procedure two or three times before he is able to accomplish the desired results, or the operation may take more time than he at first supposed. By this plan patients and relatives are not disappointed, nor do they lose confidence in the ability of the operator.

In this way people of limited means are not deprived of the best services and the rich are charged no more than the poor. By this plan the dentist is better satisfied for services rendered than he usually is.—*Dental Cosmos*.

ARTICLE III.

CARIES.

Generally speaking, the whole range of pathological conditions to which the teeth are subject, may be classified under two heads:

1. Diseases affecting the crowns of the teeth.
2. Diseases affecting the roots and socket.

Except traumatic lesions, both these classes of disease are preventable by conscientiously following strict rules of hygiene. An attempt will be made later on to formulate these rules.

It requires no argument to persuade you of the truth of the hypothesis that "the disease known as dental caries

will not occur except where the causal microbes are permitted to grow undisturbed on the teeth." The rational conclusion is, then, that if the teeth are not allowed to accumulate deposits on either their exposed or protected surfaces, they will be exempt from caries. More broadly stated the proposition is :

Given the varying predispositions of different individuals to caries, which is governed by the laws of heredity and environment, the growth of micro-organisms in the mouth is in proportion to the amount of disturbance they suffer, or rest and opportunity they enjoy. That is a recognized fact, and almost axiomatic.

Is the practice of dentists as followed in the daily routine of seeing patients consistent with these undisputed etiological facts? We all know it is not.

Plainly, then, one great step in the direction of the establishing of correct habits of cleansing the teeth in the general public is to be accomplished by reform of the dentist, making obligatory on him the performance of his duty. Similarly, as public sentiment now requires a man to be a graduate of a reputable college before entering on practice, so can it compel him to teach oral hygiene and require his patients to observe its rules.

For the purpose of convenience, allow me to place people in three classes with respect to the care they give their teeth. A few people by assiduous, intelligent care and a natural tendency to cleanliness to the teeth themselves, have clean teeth from year to year; the proportion is very small indeed, say 1 per cent. A second class are just as anxious and spend as much time, or perhaps more, but their efforts are ineffective because misdirected and on account of unsuitable cleansing implements and materials. But most people give to their teeth slovenly care.

If we are justified in assuming that caries and pyorrhea alveolaris, the two diseases most destructive to the teeth, only occur in the presence of foreign matter which is al-

lowed to accumulate on them, we next want to know how to prevent the accumulations.

My own belief is, that it is possible in most cases for the individual to keep the teeth free from all deposits and food *debris*. I have been led to this belief by the study of several cases which have been under my care and observation for some time past.

At the first appointment examine the mouth as to the degree of cleanliness usual to the person, and make a note of the conditions in the record book for future reference. Catechise the person to ascertain what are the present habits as to the number of brushings per diem, dentifrices, floss, tooth-pick, etc. Make notes of each point. Then show to the person with mirror every part of the teeth which is unclean. The patient may apologetically, or even indignantly, say that it is impossible to be more thorough than he is. It is not prudent to deny this at the time if you wish to accomplish your purpose, unless to explain that you may be able to help him to be more successful. You must gain his good will and inspire the desire by giving arguments for ordinary (ordinary in its new sense) cleanliness, and explaining its benefits.

It is now proper to scale and polish perfectly each tooth. The mirror should now be used again to show the patient the change. Now is your time to teach a lesson of the most forcible kind. Say to him, "It is quite possible for you, by your own efforts, to keep every tooth in your mouth absolutely clean." Make this statement positively and dogmatically. With the effrontery, if you please, of a bichloride of gold doser promising his dupe a sure cure. The moral effect of such an assurance and the placing of the responsibility where it belongs will be very helpful.

The instructions in the daily care to be given the teeth should now be distinctly and carefully impressed on the patient's mind. Printed directions for children might be useful, but I have never tried them.

Now, you may say all this and more—some people will acquire the habit easily—others, never. It is your business to labor patiently to the right end.

At the next appointment, for a filling, perhaps, make inquiries to see that your instructions have been followed.

If they have not, in every detail, reassert the necessity for it, refreshing the patient's mind, and, in some cases, demonstrate with a brush the practicability of your statments. Be careful not to lay down more rules than can be followed.

This system of following up the matter as long as the appointment lasts, seeing to it that the patient's efforts are sustained and effective, and that the habit is formed, are the most important and valuable services you can render in your capacity as a dentist.

The task is not a thankless one; your labor will invariably be highly appreciated, and as these patients come back to you from time to time, it will be one of the greatest satisfaction of your professional experience to be able to say, after the most conscientious examination with the most searching of fine explorers, that you find no decay—no pockets.

Now as to rules: Of first importance, of course, is the use of the brush. Twice daily is sufficient—at night before retiring and in the morning. It is of the utmost advantage to have three brushes in use. This is imperatively required—*three brushes*. A brush will not do effective work unless it has time to dry out. The bristles will always be too soft if it is used more than once in twenty-four hours. More good is obtained by this than one would expect without trying. What is known to the dealers as "medium" grade of stiffness is the best. To the well kept mouth with all its parts and members in a healthy state, a good vigorous brushing with a moderately stiff brush is a pleasurable sensation. Three brushes in use at the same time will also give longer service than if bought consecutively.

The usual instructions as to vertical movements should be given. Special directions are necessary to make the patient reach all the accessible surface. Remember that few people do this. It becomes your duty to dispel the common delusion that the last molar and lingual surfaces cannot be brushed. Any one can touch all these surfaces who will use his brain, and for a time watch himself during the process. The old slovenly or thoughtless habit is to be broken up and a new set of movements learned. Insist on thoroughness, and keep on insisting.

Dentifrices: Some form of powder is the only proper dentifrice, and it should always be used whenever the brush is used.

A pound can or bottle from which the small bottle for present use may be replenished is indispensable in preventing a giving out of the supply and a consequent deposit of calculus by a few days' forgetfulness to go to the druggist. Aim to make the powder as agreeable as possible, especially for children.

Women and children can be induced to use floss silk or rubber bands for interdental spaces at least once a day. Men should be encouraged to use the tooth-pick.

Disinfectant and antiseptic washes are allowable and useful, but should not take the place of powder applied by brush at the stated intervals. As a rule I recommend it only in special cases. The best results are obtained by the simplest means faithfully employed. It is more than probable that the individual whom we have in hand will have anywhere from three to a dozen appointments for the other needed operations. Opportunities are thus afforded to assist in putting him on the right track. You have given him a good start—how shall he be watched?

One or two months later, by previous arrangement, he must be summoned to your office for inspection. Perhaps—yes, usually—a little scolding and lecturing will be necessary to put him right. At suitable intervals he must be notified again, and both of you will be delighted at the fine appearance and freedom from disease presented.

My own experience is that it is not a difficult matter to bring about this happy condition, and one success pays for a score of failures.

RESUME.

A statement to the patient of the advantages and desirability of absolute cleanliness of the teeth.

Namely, that it affords immunity from caries of crown and loosening of tooth in socket.

Economy of time.

Economy of money.

Economy of pain, and preservation of natural teeth all through life.

A statement of the means to be employed to maintain absolute cleanliness of the teeth.

Establishment of habit.

Brushing the teeth three times a day.

Thorough brushing of labial and lingual surfaces twice daily with powder.

Silk, rubber bands or pick.

Regular visitation by appointments for inspection and instruction.—J. W. WASSALL, in *Dental Review*.

Editorial, Etc.

THE JUDGE AND THE DOCTOR.—A most extraordinary decision, says the New York *Medical Record*, has recently been given by Judge Levy, of California, in the case of Dr. C. Ellenwood, who had a claim of \$30,000 for medical services rendered to the family of a deceased millionaire. The executors of the estate and the three heirs all allowed the bill, but the Judge thought it too much and cut it down to \$10,000! The Judge says in his opinion: "Although inexperienced in the charges of medical gentlemen for professional services, I am at a loss to recall a case where such an amount has been charged. I am of the opinion that

the services rendered for one year's term were not of the value of \$30,000, but a fair, reasonable and just compensation would be \$10,000, for which amount this claim is allowed." Yet lawyers charge a much larger fee for services of much less intrinsic value. We hope that Judge Levy may be taken pleasantly and chronically ill, and then that Dr. Ellenwood may be called to attend him.

AN INFANT BORN WITH TEETH.—J. Kaufman, M. D., in *Medical Record*.—The following curious case of an infant born at the 7th month of pregnancy with a full set of teeth I think worthy to be recorded. "I delivered Mrs. M. B., a primipara, aged 17, strong and robust, in her seventh month of pregnancy of a male child. The labor was rather tedious and the child was born asphyxiated. On introducing my finger into the child's mouth a sensation of teeth was imparted to it from the upper and lower jaw. I did not pay much attention to this at the time, being occupied with the resuscitation of the child, in which I succeeded. The next day finding that the child refused to take the breast, I examined its mouth and to my utter astonishment I found a full set of teeth in the upper and lower maxillæ. The mother, on being told of this, remarked that she had dreamed it the night before".

OPERATIONS ON THE SUPERIOR MAXILLA.—Pantalonì (*Arch. Prov. de Chir.*, 1892, No. 3) concludes that by the use of the position recommended by Rose in operations upon the superior maxilla, the use of the gag of O'Dwyer, the fixation of the tongue by forceps, and the hæmostatic use of tampons, perfect antiseptic conditions can be had without the annoyance of hemorrhage during the operation, while complete narcosis can be maintained throughout the operation by the interrupted method of chloroform anæsthesia. These methods, he believes, make unnecessary a previous tracheotomy and ligation of the external carotid, as also ligatures during or after the operation.

AMOEBAE IN AN ABSCESS OF THE JAW.—Flexner (*Johns Hopkins Bulletin*, 1892, No. 25, p. 104) has reported the case of a man, sixty-two years old, who, nearly two years before coming under observation, had noticed a small hard lump within the mouth, beneath the gum, at the anterior part of the inferior maxillary bone, just to the right of the middle line. After two months the tumor was removed by an operation. Five months later an ulcer appeared at the site of operation, exposing the bone. A slight discharge set in and continued thereafter. In the course of fourteen months a hard swelling again appeared on the floor of the mouth, gradually increasing and extending beneath the chin to the front of the neck and below the jaw, forming a large and prominent swelling that occupied the entire space included within the arch of the inferior maxillary bone. The width of the mass corresponded with that of the lower jaw. The growth extended backward to the angle of the jaw and downward to the cricoid cartilage. It was firm, indurated, and immovably fixed, and felt like a solid growth. At the most prominent point of the tumor in front, however, tenderness was present and fluctuation could be detected. The teeth of the lower jaw were deficient. On the upper aspect of the transverse portion of the inferior maxilla the bone was denuded in a situation corresponding with the two incisors and the canine tooth of the right side. The exposed bone appeared spongy and was evidently necrotic. It was in part covered with dirty grayish purulent matter and shreds of greenish sloughing tissue. On making firm pressure over the tender and fluctuating area on the anterior aspect of the swelling, a small amount of dirty purulent material was observed to ooze from an opening in the mouth over the necrotic bone. The breath was offensive. There was no glandular involvement. An incision evacuated about two and a half ounces of pus and exposed a large abscess cavity, the walls of which were quite thick. The necrotic bone was thoroughly scraped, the abscess cavity packed with iodoform gauze, and a dressing applied. The man did perfectly well, and at the time of the report bade fair to recover. The pus evacuated was grayish-yellow in color and extremely offensive in odor. It was not thick, but was mixed

with a small quantity of blood, and contained a number of flakes and granules of lighter color and more opaque than the other constituents. Microscopic examination disclosed the presence of pus-cells, red blood-cells, bacteria, and amœbæ indistinguishable from the amœbæ dysentericæ; the last were especially abundant in the flakes. Subsequently, examination of the contents of the drainage-tube employed disclosed the presence of the same organisms. There was no history of diarrhoea.

ANCIENT JEWEL-POINTED TOOLS.—A year's study at Gizeh has convinced Mr. Flinders Petrie that the Egyptian stone-workers of 4,000 years ago had a surprising acquaintance with what have been considered modern tools. Among the many tools used by the pyramid-builders were both solid and tubular drills and straight and circular saws. The drills, like those of to-day, were set with jewels, (probably corundum, as the diamond was very scarce,) and even lathe tools had such cutting edges.

So remarkable was the quality of the tubular drills and the skill of the workmen that the cutting marks in hard granite give no indication of wear of the tool, while a cut of a-tenth of an inch was made in the hardest rock at each revolution, and a hole through both the hardest and softest material was bored perfectly smooth and uniform throughout. Of the material and method of making the tools nothing is known.

SWALLOWED A TOOTH.—A domestic while taking a drink of water swallowed a false tooth, which had been held in position by a metal plate. All efforts to extract the tooth failed, and the woman died of hemorrhage a few days later. At the autopsy it was found that the plate had caused a perforation of the esophagus just above the entrance to the stomach.

AN OVERPRODUCTION OF SCHOLARS.—In an article in the "Forum" for January by Dr. Geffcken the curious fact is brought out that in Germany there has been too much of the higher education. Special culture, unsustained by an income from property, is found to be in many cases a misfortune. The average demand in Prussia for "assessors"—men of legal training who have passed through the gymnasium and university and served the State gratis for five years—is 100, while the actual number is, 1,851. There is thus no employment for very many of those prepared every year for the legal profession. There are over 7,000 examined architects without fixed employment. It is the same with engineers, teachers in the classics, mathematics, &c. "Men of university training," says Dr. Geffcken, "are almost without exception capable only of intellectual work." They cannot, or will not, take to a trade, but flock to the cities and take to pettifogging, giving lessons, writing for inferior papers, &c. "There are lawyers, physicians and doctors of philosophy," he adds, "among those who are regularly relieved by the Berlin poor board." It was once believed that the State had no more important duty than to educate the greatest possible number of its youths to the greatest possible extent. This, it seems, is a mistake. Germany's educational system is top-heavy. There are perhaps other countries where the supply of men educated for the professions is excessive. The world's work is not all head work. Different communities require it in different quantities, according to their varied circumstances.

A WOMAN SWALLOWS A RAZOR.—Jane Savage, a working woman in Lincoln, Eng., while cleaning house last week, placed her brother's small razor between her teeth that she might have both hands free to take down a shelf. As she reached for the shelf the razor slipped half way down her throat. She tried to catch her breath, and thus drew the razor so far down that when a surgeon was called he was unable to relieve her. She was taken to the Lincoln Hospital and examined. Her

throat was badly swollen, but the razor was gone. Yesterday she complained of severe pains in her stomach, and symptoms of acute inflammation were discovered. This morning, therefore, her stomach were opened. The razor was found, tightly closed as when she swallowed it. The removal of the razor was followed this evening by the relief of all pain. The woman is doing well, and probably will have recovered fully in three weeks.—NEWS from London.

A FATAL CASE OF NOMA IN AN ADULT.—Hansson (*Centralbl. f. Chirurgie*, 1892, No. 41, p 845) has reported the case of a man, fifty-five years old, who had the carious first molar tooth of the upper jaw removed. There was also a pretty firm œdematous swelling of the entire right cheek, and inspection of the mouth disclosed the existence of a stomatitis. Energetic antiphlogistic measures were at once instituted, but the swelling of the cheek progressed in intensity, the lower eyelid becoming involved. The skin of the cheek was tense, pale, and of a wary appearance. In the mouth, opposite the site of the extracted tooth, was a necrotic area as large as a cherry stone. This was excised, and a thorough application of silver nitrate made. The mouth was frequently washed with antiseptic solutions. The swelling diminished somewhat, but the gangrene extended. The discharge of saliva was abundant and offensive. The gangrenous tissue was again excised, but the process was not controlled; on the contrary, it extended to the neck, to the nose, and to the ear. The gangrene became more profound; symptoms of septicæmia appeared; and a purulent bronchitis developed to which the patient succumbed. An autopsy could not be held.

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Monthly Summary.

PRODUCTION OF PLATINA IN RUSSIA.—The platina veins in the Ural mountains are unique in that this metal is found there in grains. Platina is also found in Brazil and in the Cordilleras, but in none of these places is it obtained in grains. In Goroblagodatsky there are sixty-six mineralogical societies for the exploitation of platina, which search the coasts of Touri river and its tributaries.

The demand for platina, which increases every day, dates only from twelve to thirteen years ago. During the past decade the output of the metal has diminished till about 3,194 kilo. annually, more than half being obtained from the northern veins of the Ural mountains, which belong to the Empire. The total consumption of the world reaches 3,270 kilo., but the increase of the manifold applications of this metal in industries must increase that figure considerably.

When the demand for platina is insignificant and the price very low, the miners who find it when searching for gold use it for small shot on hen-birds. All the platina which is obtained from the Ural mountains, after the payment of a tax of three per cent. in material, is sent in a rough state to St. Petersburg, to be shipped to foreign markets.—*La Odontologia*.

VARIOUS BLOW-PIPE FLAMES.—Thomas Fletcher, the well-known expert in practical metallurgy, gives the following directions for the use of the blow-pipe:

The flames may be separated into two classes. Those used for blow-pipe analysis are produced by air jets of small bore, and as smooth as possible inside; the theoretically perfect jet is made of glass tube drawn out small, and broken off where the required bore exists. The advantages of this jet is the perfect smoothness of the bore, which enables the operator to produce perfectly defined flames, with the reducing and oxidizing zones large and clearly defined. The disadvantage

of the glass jet is its delicacy and constant liability to injury. Next to this comes the platinum tip, which remains fairly smooth inside; and last of all comes the simple and cheap brass nozzle so universally used. The flame in this class of blow-pipe is produced by an air pressure low enough to prevent the breaking up of the blue cone, the tip of which is the hottest part; inside this blue cone is the reducing flame; beyond it is the oxidizing zone. For brazing and soldering, a heavier air pressure and a larger bore jet are required; the blue cone is broken up, and the different zones of flame are much less clearly defined, and in practice are much less important. The flame is still roughly divided into a blue, or greenish-blue center, and an outer yellowish mantle, surrounding and projecting beyond the blue. The rough point of the latter is, as before, the hottest part, and this should touch the work to be brazed. It has a distinctly oxidizing action; but this is overcome in practice by the protection of the flux used, which must have the power of dissolving oxides.—*Dental Pract. and Advertiser.*

FAILURE IN CROWN WORK.—By H. B. Meade, D.D.S., Buffalo, N. Y.—Many articles have been written concerning the failures made in banding roots for crown work, and many dentists have abandoned the use of collars or bands entirely, because a few cases have come under their observation in which a band was poorly adjusted, there being a V-shaped space between the band and root, the parts being in a highly inflamed condition. If bands are to be fitted in this manner, it would be better to discontinue the use of them at once, but with the exercise of intelligent care, no such space is necessary.

We must bear in mind that we are dealing with one of the most delicate tissues of the human anatomy, when we extend a band so far up the root that it interferes with the periodontal membrane. If we take into consideration the anatomical form of any of the anterior roots, after the crown has been excised and ground down to the gum line, and then imagine the fitting of a band to nothing more or less than a cone, commencing at its base, we will at once see how the V-

shaped space is produced, as the band must* necessarily be as large as the end of root, that it may be driven on.

To overcome the V-shaped space, and have the parts remain in a healthy condition, the band must not be driven on a root that has had no other preparation than merely the crown excised and ground down to the gum-margin. The remaining portion of the enamel that lies under the free margin of the gum must be removed, care being taken so to shape the root that its sides will be parallel, and the band must not extend further than the free margin of the gum. A band adjusted in this manner (using pure gold) will cause no inflammation. The end of the roof should be ground concave from labial to palatal surfaces, giving it the same curvature as the gum line. This will make the fitting of the porcelain crown to the band an easy matter.—*Dental Pract. and Advertiser.*

DRYING OF PAINTS.—We commonly speak of paints as "drying," and the term is entirely correct from one point of view. Yet it is not a process of dehydration, for, of course, there is no water to evaporate. It is a chemical process, the oxygen of the air combining with the oil to make a solid body. In the course of this oxidation the coloring matter of the paint mixture is fixed in the solidified oil, and hence the tint is permanent as long as the oil lasts. The preservative qualities of paint are due to the fact that the oil and pigimentary matter forms an impenetrable coating.—*Dental Pract. and Advertiser.*

WHEN WE SEE a young dentist peering round here and there, sparing no pains to find "the lay of the land" in every direction, and insinuating himself into the good graces of every one he meets, and becoming a favorite with old dentists, concealing nothing and learning of all, we make up our mind this young man is going to succeed. But when we see one coming home from college in a dandy suit, to be admired and waited on, and sitting down in the parlor in egotism and self-consciousness, to wait for rich patients, we do not count on him.—*Items of Interest.*

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ARTICLE I.

SOME PROPERTIES OF GOLD FILLING.

Malleability and ductility are in all cases due to and dependent on cohesion, which may be defined as that force which binds and holds together the ultimate constituents or particles of any solid.

Gold in its pure state possesses this property to such an extent that two masses of it, under suitable conditions, may be as perfectly united in their cold state as they could be if fused by the aid of heat.

If two sheets of pure gold of moderate thickness, with perfectly clean surfaces, be laid one on the other and passed between the rolls of a rolling mill, they will become so thoroughly united that no amount of force can separate them. The same result will take place between a sheet of pure gold and one of pure platinum under the same conditions. It is in this way that the crown-metal so largely used to-day in crown- and bridge-work is produced.

So, too, in the process known as fiber-plating, for the

production of filaments from which gold lace is woven, a rod of silver is gilded by simply burnishing leaves of pure gold on it. It is then drawn into wire so fine that a length of it extending a mile and a quarter will weigh but one ounce. And how much would the gold on its surface weigh?

How is this perfect union brought about? Either one of two theories will account for it. One, the molecular theory, holds that while the attraction of cohesion operates on all solid bodies, its operation is only sensible at insensible distances. When, therefore, the molecules of the same body, or of two similar bodies, are brought within the sphere of this attraction, cohesion takes place.

The other, which for want of a better name we may call the dynamic theory, holds that the molecules of masses of matter are held together by being interlocked with one another, either naturally or by being compelled to assume such a relation under the influence of pressure.

It would seem as though, in the instances cited, both the molecular and dynamic forces operated to produce the result, for union between the metals will not take place unless they are brought into the closest possible apposition, nor will it result if the metals have been hammered or rolled and not subsequently annealed. When a nugget or ingot of gold is subjected to pressure its bulk is sensibly reduced, but when heated to a point slightly below fusion its original dimensions are restored.

This latter process is known as annealing. So, also, when a mass of gold is beaten or rolled it assumes a condition of stiffness and intractability, but its original softness and plasticity are completely restored by annealing. These changes in the mass are explained by the universally conceded fact, that under the influence of pressure the molecules are driven into closer proximity than is natural to them, and that heat, by expanding the mass, allows the particles to move slightly among themselves, and resume, as nearly as may be, their former relations to one another.

Gold, when being beaten into foil, is frequently annealed to restore to it the softness which has been lost in the process of hammering. It also restores its cohesiveness.

Some manufacturers of gold foil have a method of rendering it non-cohesive by a modification of the process.

The process of imparting this property to pure gold is kept a secret by the few who understand it. Truly non-cohesive gold possesses the quality of softness or pliability in a remarkable degree. This it could not have without the final annealing after beating, which, in restoring the softness, would also re-establish its cohesiveness. It is therefore reasonable to suppose that it is again deprived of its cohesiveness.

We have seen a cavity filled with non-cohesive gold by pricking it with two cambric needles set in wooden handles. The filling when completed was dense, and the layers of foil were so well united that they could not be separated. While nominally a non-cohesive filling, the layers are really held together by pure cohesion at the point where they are pricked.

Non-cohesive gold has for many years been sold and used under the less distinctive name of soft gold. The latter term, however, is a misnomer, for, as we have stated, all pure gold is soft unless this property has been interfered with by hammering or rolling. No foil can possibly be softer than cohesive foil, but the misuse of the term soft has arisen from the fact that in the manipulation of non-cohesive foil the layers will slide over one another without cohering, which seems to emphasize or exaggerate the impression of softness. The absence of this sliding or gliding quality in cohesive foil naturally but improperly suggests the idea of hardness. In large and accessible cavities, where no necessity exists for the sliding of gold on gold, cohesive foil will be found to be equally as soft and tractable as the non-cohesive variety.—S. H. GUILFORD, in *Cosmos*.

ARTICLE II.

FILLING THE ROOTS OF SECOND MOLARS.

The following question has been sent us, with the request that it be answered in these pages :

"If a superior second molar, with pulpitis and pericementitis to the extent of soreness is presented, and you decide to destroy and remove the pulp and fill the roots, how would you proceed in detail, the patient being in good general health and the mouth in fair condition?"

The second molar presents but few complications that are not found in the first. It is further back in the mouth, and hence a little more difficult of access, but the roots or pulp chambers do not differ materially. The first symptom that demands attention is the pulpitis, for the pericementitis is dependent upon that. If there be considerable congestion of the pulp, it sometimes is not easy to destroy it without considerable pain. Usually, however, this will yield when the cavity of decay, which we will assume is the cause, has been cleaned out, and the pulp thoroughly exposed and bled. If not, tincture of aconite will give relief.

Of course it makes a great deal of difference where the cavity of decay is. If it is in the occluding, or mesial surface, there will be little trouble. If it is upon the distal aspect, the task will demand more care and skill. In either case, the cavity should be thoroughly rinsed with warm water, using repeated douches. With enamel chisels the cavity should be opened up so as to allow free access. The rubber dam should be applied, and the cavity dried out with the hot air blast. Usually this will obtund the tissues sufficiently to allow working without severe pain. If it does not, carbolic acid may be used, and the decayed tissue and debris should then be as thoroughly removed as possible. All pain will by this time usually have ceased.

If it has, the pulpitis will give no further trouble. If not, medication with aconite may be necessary. If there be excessive tenderness in the living pulp, this may be overcome by applying a solution of cocaine.

I know of no better devitalizing application than that recommended by Dr. Miller, in the July number of this journal. It consists of equal parts of arsenious acid and cocaine hydro-chlorate, mixed into a paste with a sufficient quantity of carbolic acid. A little—a very little—of this should be placed in a minute cup of tin or lead, prepared as follows: From a sheet of taggers tin, or rolled tin, or lead, punch out, or with the shears cut out, a disk of a sufficient size to cover the bottom of the cavity. Place it upon a piece of soft wood, and with the rounded end of an excavator handle indent it until it has a cup-shaped depression. Put the arsenious acid mixture in this, and carry it to place over the exposed pulp.

My usual way is to cover this with a pledget of cotton dipped in chloro-percha. Miller recommends the oxy-sulphate of zinc, or even plaster of paris, and these no doubt have their advantages. But by the use of the protecting disk, pressure upon the exposed pulp by a cotton plug may be avoided. I leave this application in the cavity about forty-eight hours. It may probably be left longer without danger, but at the end of two days I usually find the pulp thoroughly devitalized, and without much sensation.

At the end of this time the dressing is removed, using the rubber dam as before. The pulp chamber is opened thoroughly, and an antiseptic introduced. This may be one of the essential oils, or it may be our old and much abused, yet excellent friend, carbolic acid. I propose to coagulate the ends of the dentinal fibrillæ, if it has not already been done, which is most probable. The cavity is then sealed up again for another two days, when it is once more opened under the same precautions as before. A delicate Donaldson barbed broach is now introduced into

the root canals, turned a little and withdrawn, usually with the pulp clinging to it. I do this for each of the three roots—if I can—then introduce pledgets of cotton upon a delicate smooth broach, carrying them as near to the apex of the roots as possible, and again seal the cavity up, unless there be some urgent necessity for haste.

When I am ready for filling the roots, I do it with chloro-percha, pumped into each with a smooth broach. When I am satisfied the root canal is full, I introduce a gutta percha point, and that root is supposed to be effectually sealed for all time.

I said that I go to the apex of each of the three roots if I can. Unfortunately this is not always practicable. I may state it stronger than that, and say that it is not often possible. The conformation of the roots will not permit. There is usually but little difficulty in finding and reaching the apex of the lingual root, but the other two are not as accessible. In the first place, both the anterior and posterior buccal roots are frequently curved, the flexure usually being forward. This makes the anterior root canal hard to find and follow, even if the opening be patulous. If the cavity of decay be upon the distal surface, it is absolutely essential that it be extended up through the coronal surface, quite to or past the central pit. The openings of all the roots must positively be uncovered.

If with a delicate broach I find that I cannot penetrate either canal, or for but a short distance, I seal the cavity up with gutta-percha, first introducing into it a small pledget of cotton wet with an antiseptic, and leave it for a week or ten days. By this time the contents of that canal will have sloughed away, or at the least will have separated from all attachments, and will come away of its own accord, without putrefaction. I can then treat and fill the canals as well as possible. If they are too small to admit the most delicate broach, I have not much fear of their containing sufficient matter, even though it have putrescent possibilities, to cause any harm. I cannot believe that the

contents of the dentinal tubuli ever become septic. The tubuli are too small to permit the entrance of putrefactive organisms, or if not, the amount of putrescible matter is not sufficient to produce septic complications.

To a much less extent is this true of those root canals that are too small for the entrance of a fine broach. If time enough be given for the sloughing of the canal contents, and if then they are subjected to the penetrating action of an antiseptic, and finally if the mouth of the canal be hermetically sealed with gutta-percha, I will take my chances with it. There is, in fact, nothing else to do, for my wildest flights of imagination do not reach to the point of successfully drilling on such roots as these, with any possible kind of a drill.

The posterior buccal root has even another possible complication. It is apt to be wide and flat, and very thin in the center, the canal having the same characteristics. At either lateral border of the root there may be a channel, while in the center it is very much constricted, or even obliterated. There may be chambers somewhat along the course of the canal, which it will be utterly impossible thoroughly to clean out. There is absolutely no way of removing any pulp tissue from them, except by the slow process of allowing it to disintegrate and slough out, antiseptics excluded, for they would tend to prevent this. If the pulp chamber be open, this may sometimes be permissible, trusting to the penetrative power of antiseptics thoroughly to cure them afterward.

But with the utmost care and thoroughness there will be cases presented in which it is quite impossible to be sure of the condition of the roots. At least I find it so in my practice, for I am not one of those who can see to the bottom of an impenetrable root canal. But with thorough antiseptic treatment, I have little fear of any subsequent trouble from such roots.

It may be urged that all this is a very tedious and prolonged process. Well, if the dentist is not prepared to

give to the case all the time and attention necessary, he had better not undertake it. The proper treatment and filling of the roots of a superior second molar tooth is a process that requires care, and patience, and skill, and he who does not possess enough of the last two to insure the first, can never take rank as a successful operator.—
EDITORIAL in *Dental Pract. and Advertiser*.

ARTICLE III.

ANCHORAGE OF GOLD FILLINGS.

BY S. B. PALMER, M. D. S., SYRACUSE, N. Y.

Read at the Twenty-fourth Annual Union Dental Convention of the Sixth, Seventh and Eighth District Dental Societies of the State of New York, held at Binghamton, October 25th, 26th and 27th, 1892.

In rearing structures of importance, whether bridge or building, a good foundation should be the first consideration. This principle applies as well to the foundation of fillings in teeth, which rest upon dentine as different in structure and durability as rock and sand. It is customary to speak of this subject as anchorage, while foundations would better express the conditions. The architect's ideal foundation is "solid rock," yet he must contend with all the intermediate grades to "sinking sand."

To obtain good results from filling, it is as important that the structure and condition of the dentine be understood, as how to insert a gold filling. There must be harmony between the two or failure will be the result. At least three conditions are necessary to produce permanent gold fillings: normal dentine, accessible cavities, and good manipulation.

No 1.—The ideal filling is one of cohesive gold throughout, well contoured and anchored in firm tooth

structure. These happy combinations are not always present, and the requirements must be met by combinations of other preparations. It is true that a few skillful operators claim to accomplish all that is required with cohesive gold alone. Allowing this claim, there is a waste of energy for the operator and needless strain upon the patient, without corresponding benefits. One thing should not be lost sight of: that it is a fixed law in nature that a metal filling in the mouth exerts an electro-potential influence to decompose the fluids that may be between the filling and the walls of the cavity, or in the dentine itself, when that is much below normal density. This decomposition is according to the conductivity of the plug and its powers to resist oxydation. Thus, gold being the best conductor and free from oxydation, it acts with greater persistency than tin or amalgam. Let no one be deceived, and make a mistake in trying to circumvent this law by perfect manipulation, without a cavity lining which will exclude moisture. Although cavity lining is not anchorage, it has much to do in laying the foundation for fillings. Your attention is called to a few specific cavities and conditions of dentine, with recommendations for treatment in starting fillings:

First. Assuming that an accessible cavity is properly prepared in dentine of normal structure, with undercuts or angles so that the first piece of gold inserted is held firmly, upon which every other piece is made to cohere until the plug is completed, no finer filling can be produced, in appearance, or for tooth preservation, and thus credit is given to all who can do this superior work.

Care should be taken not to drill deep anchor pits into the vital dentine, as formerly practiced. Much harm has been done by or through the thermal changes thus introduced.

No. 2.—Foundations of soft gold for cohesive plugs.

A large proportion of gold fillings are made in this manner, and probably each operator has a method which

suits him well. The one which best answers my purpose is to commence with one or more cylinders. Without describing the kind of cylinder recommended, we might as well say pellets. There is nothing in the market that answers the purpose, and we may better give a description how to make cylinders now, than later on.

Ney's No. 4 foil is best adapted for cylinders, on account of the roughness imparted to it by the book paper under pressure. Smooth foil makes cylinders too hard. The leaf may be cut into half, third or one-fourth strips, the ribbons folded to a width according to the depth of the cavity. Cylinders should be kept on hand and the selection made as required. The narrow strips are rolled around a broach, or better, a three-sided point attached to a firm handle. When the roll is drawn from the point, the ends should be slightly pressed with the pliers.

Let us now consider a cavity located in the grinding surface of molars, medium or large, surrounded by firm enamel borders, the bottom of the cavity flat or concave, as the case may be on the removal of the decalcified dentine. If the dentine is firm and dense, the cavity is ready for gold. When soft and sensitive, yet firm enough to warrant filling, varnish the cavity with some quick drying varnish. I am using Canada balsam cut in chloroform. Without waiting for the varnish to harden, line the bottom of the cavity with a piece of gold foil of two or three thickness. Upon this lining place a cylinder which will about fill the orifice of the cavity; if too large, compress it. The length of the cylinder may be one-half or two-thirds the depth of the cavity. Then commence with cohesive gold. Every piece introduced remains firm and is driven into the folds of the cylinder, condensing and expanding laterally every portion of the plug at the base, giving lateral pressure against the walls of the cavity, and the anchorage is perfect.

Condition No. 3.—Approximate cavities in molars or bicuspsids, extending from the cervical border to the grinding surface.

Fillings contoured. Matrices well adapted to this class of work are made of rolled aluminum, wide enough to extend from the gum to one-half the length of the crown, and beveled to a knife edge. Insert a matrix of suitable thickness and bend the ends away from the tooth, thus giving full view and access to the cavity. The matrix is used only to prevent the first pieces of gold from falling out, and not to mould the filling. The cavity being in readiness, the portion next to the gums only should be varnished, as any like coating on the enamel, or even the dentine, prevents the mechanical bite which gold has without an enamel varnish.

Select a cylinder smaller than the cavity, but longer than its depth. Carry one end of the cylinder into the cavity, and force the outer end towards the gums upon the incline made by the knife-edge matrix. When the cylinder has been firmly pressed to the cervical border of the cavity, another cylinder may be placed by its side, or one on either side, and packed as before. Thus a firm and broad foundation is laid upon which cohesive gold may be packed to finish. When done, one end of the aluminum is bent straight, and the piece drawn out laterally. When the projecting ends of the cylinders are condensed and the plug finished, no portion of the filling will be more perfect than that at the cervical border.

Condition No. 4.—Same as the last described, except that the cavity extends beneath the gums. A case in practice will be sufficient.

A patient, while absent, had occasion to have a bicuspid filled. The cavity extended beneath the gums. The dam was applied and two unsuccessful attempts made to fill with gold. The patient returned with a phosphate filling. Examination showed it useless to apply the rubber. The cavity was prepared and filled with amalgam to the cervical border, and the remainder with gutta-percha, and the patient dismissed. At the next sitting, the amalgam was cut down for a fastener, the rubber applied and

the tooth filled with gold. One year's time shows no discoloration from the amalgam.

No. 5.—Cavities upon buccal or labial surfaces, extending beneath the gums, so as to make it difficult to apply the rubber, especially the shallow crescent-shaped cavities in centrals and laterals. Prepare the cavity with no more depth than its necessary to remove softened dentine. Let the margin be distinct and the walls at right angles with the bottom of the cavity. Protect the teeth with napkin or paper, and fill with bibulous paper between the teeth on either side of the cavity. Dry the cavity and exposed gums thoroughly, and varnish both cavity and gums, allowing the varnish to pass beneath the gums where there is space, which will prevent moisture from capillary attraction. Line the cavity with crystal gold. First go around the border of the cavity, then build across until the cavity is lined with a basket of gold. Upon this foundation may be anchored a solid gold plug of any cohesive gold, without danger of falling out or decay around it.

This method is the same as that given by Dr. Howard in a clinic at Rochester, and it more than meets his claims in filling the porous dentine, whereby fluids are excluded and secondary decay prevented. With a little practice, filling this class of cavities is made easy.

Modification and adaptation of the principles here laid down will meet all conditions of anchorage for gold fillings, nor is the preparation of foundations less valuable for amalgam, gutta-percha, or phosphate fillings. The indications for use of varnish under oxy-phosphate, are sensitive dentine or near approach to the pulp. No acid excitement is experienced with this cavity lining.

Under gutta-percha it is valuable in fastening the filling to the walls of the cavity, in conditions unfavorable for the exclusion of moisture, as each piece of filling remains fixed in the cavity. It is true that chloro-percha, and some of the essential oils also, cause the filling to adhere,

but the lining is much softer and yielding than varnish. In connection with amalgam it may be used as with gold, as a lining for cavities where poorly calcified dentine must remain as the pulp covering; also in cases where dependence is placed upon oxydation to fill the dentine. So far as I can determine, this answers the same purpose, with much better appearance. Amalgam fillings inserted in heavy varnish remain bright upon the surface in contact with the cavity walls, which is not the case in any amalgam touching dentine.

Again, where there is no action upon the metal there is none upon the dentine; thus amalgam which contains no copper may be used with equally good results, without discoloring the teeth.

In conclusion, science teaches that the result of every operation in filling is the outcome of principles laid in the foundation and observed to completion. Whatever is success at any time will be for all time, under the same circumstances and conditions.

Progress is based upon the knowledge and application of principles leading to better methods. Thus we are stimulated to search for more knowledge and higher attainments.—*Dental Pract. and Advertiser.*

ARTICLE IV.

THE ADVANTAGES OF NITRATE OF SILVER IN DENTAL PRACTICE.

BY A. M. HOLMES, D. D. S.

When I received the request from the President of the Sixth District Dental Society to read a paper at this meeting, I hesitated, and was at a loss to know what to contribute that had not been written and talked over and over

in society meetings; still, duty required that I should respond, and I decided to give something of my personal experience in the use of nitrate of silver in the treatment of diseases of the teeth, with the hope that, although it had but recently been up for discussion in dental societies, by reason of the able papers of Dr. Stebbins, the subject had not become threadbare, and that you would find something of interest in its consideration. The character and scope of the discussions that I have read on the use of this remedy for the treatment of diseased teeth, have been such as to impress me with the belief that its benefits are not generally understood and appreciated.

Nitrate of silver is conceded to rank as one of the most efficient and reliable remedies in medicine and surgery, and when its merits are fully known it is believed that it will be found equally efficient in the treatment of a large class of diseases of teeth. Take for instance decay in temporary teeth; we all know from individual experience how trying it often is to fill the teeth of small children, in the ordinary way of making such operations; how they resist all efforts to excavate and fill sensitive cavities. By the use of nitrate of silver these operations are more easily made.

In approximal cavities in the posterior teeth, where the child is not too nervous and timid, cut away the walls to a V-shape, prepare a piece of gutta-percha of the proper size to fill the space, soften it by heat, and cover the parts that are to come in contact with the diseased surfaces with powdered crystals of nitrate of silver, and carry it to the place in the tooth or teeth prepared for its reception, packing it firmly, and leaving it there to be worn away by use in mastication. When that takes place, the surfaces of the teeth treated will be found black and hard, with no sensitiveness to the touch, or to change of temperature, and they will remain so indefinitely. In case the child is so timid and fearful as to prevent this course, dry the cavity, take out such softened dentine as the pa-

tient will permit, carry the crystals on softened gutta-percha into the cavity, and pack it, leaving it to the time when it is desired to replace it with a more thorough operation. On removal of this filling, the dentine will usually be found hard, without sensitiveness, and needing but little excavation for the final filling.

I have treated diseased pulps with nitrate of silver crystals very frequently, since early in my practice, especially in temporary teeth, where devitalizing pulps with arsenious acid is unsafe, applying the crystals direct to the exposed pulp, usually with relief to the patient.

Nitrate of silver is a resolute remedy, it cauterizes the surfaces of the soft tissues to which it is applied, but does not penetrate them as does carbolic acid, nor does it involve the entire pulp in an inflammatory condition, tending to destroy the whole mass, as does arsenious acid.

In cases of extreme sensitiveness about the necks of the teeth at the margins of the gums, where the tendency is to softening of the tissues of the tooth, a condition very annoying to the patient and troublesome to the dentist, nitrate of silver has proved more successful with me than any other remedy, in checking the progress of the disease and relieving the patient. The salt may be applied directly to the sensitive part without pain to the patient. A good method that I have practiced, is to cover the parts after the nitrate is applied with a phosphate filling material of a cream-like consistency. That hardens and prevents the washing away of the remedy, and the surrounding parts from coming in contact with the salt.

Erosion, or wasting of the teeth, is checked by nitrate of silver more perfectly than by any other remedy that I have ever used. The salt is applied to the affected parts, and covered with a phosphate filling to protect and retain it in place until it is firmly established in the dentine. In cases where the progress of the disease has gone so far as to require restoration by filling, this preliminary treatment is very beneficial in preventing a further waste of the tooth substance, and consequent failure of the operation.

In cases of superficial decay in soft teeth, where dark surfaces are not objectionable, nitrate of silver is very beneficial. By removing the softened portion of the tooth, polishing the surface and rubbing the salt into the dentine, using a warm burnisher, and varnishing the parts to protect them and to hold the remedy until it is taken into the organic matter of the tooth, there will succeed a dense, hard surface, free from sensitiveness in mastication or change of temperature. In filling cavities in the class of teeth having an excess of organic matter, with which there is so much trouble from chemical or electro-chemical action between the walls of the cavity and the filling, an application of nitrate of silver will effectively prevent these unfavorable results. The remedy is taken up by the dentine, penetrating the surface sufficiently to prevent any such action between filling and tooth.

This treatment will at times result in a darkish hue to the walls of the cavity about the filling. This I explain to patients, that they may know that it results from the treatment, and that it is a proper and favorable condition for permanency of the operation. In crowns and bridges, when the dentine is uncovered, it is beneficial to use this remedy on the teeth and roots used to sustain the bridge or crown, as a protection against thermal change, and decay. The use of nitrate of silver may be varied by applying the rubber dam, using a strong solution of the salt, and evaporating the moisture by use of a hot air syringe. When used in this way, a solution of soda can be applied to the parts to neutralize any acid remaining. In this class of cavities extending so far beneath the soft tissues as to render the use of the rubber dam or matrix impracticable, and a leakage from the surrounding tissues is liable to enter the cavity while introducing the filling and injure the permanency of the operation, cauterizing these tissues thoroughly with nitrate of silver will effectually prevent such a result.

After treatment of diseased pockets, and removal of

the deposits from the roots of teeth, nitrate of silver has proved more successful in restoring a healthy condition of the parts than any other remedy that I have used in the treatment of pyorrhœa. The finely pulverized crystals may be applied by a small spatula of wood or platinum, slightly dampening the end of the instrument and applying it to the salt. The crystals will adhere sufficiently to be easily placed in the space between the gum and the roots of the teeth. After the remedy has been left for a few moments in contact with the parts, it may be washed away with water, by the use of a syringe.

In cases of the extirpation of pulps, where the canal is sensitive at or near the apex of the root, nitrate of silver crystals carried to the sensitive part and left there for a few hours usually relieve the trouble, and the canal can be filled without pain or danger of unfavorable results.

There are some of the many cases in which nitrate of silver crystals are advantageous in dental practice. I will not detain you longer, for it was not the purpose of this paper to cover the entire field of this remedy. It is a powerful agent. It acts promptly, with great uniformity, and leaves its track in darkened surfaces when applied to the teeth. This should be considered, and its employment governed accordingly.—*Dental Pract. and Advertiser*.

ARTICLE V.

COHESIVE GOLD FOR FILLING.

From an ingot of pure gold, how can we make cohesive, semi cohesive and non-cohesive foil?

We are well informed of the fact that cohesive foil loses its welding properties if long exposed to the air, or by gases or other impurities.* Heat expels them and re-

* Dr. Watt, maker of the Crystal gold, once showed me some of his gold that had been four years exposed, that was soft and cohesive still.—Ed. "Items."

stores the original properties, but to what treatment can we subject soft foil to increase its non-cohesiveness? Is it a trade secret?

In the order of merit I consider "gutta-percha" the very best for doubtful and frail teeth. Next comes *tin foil*, then soft gold foil, and, last in the list, cohesive and the many forms of gold which require welding in their manipulations, while the plastic fillings, such as the oxy-chloride and phosphates, are uneven or uncertain in their results, yet, nevertheless, indispensable, while amalgams come in to cover for us a multitude of sins, tiding over many a troubled sea, and saving more teeth than any one of the other materials, and possibly more than *all* of them.

For the present I would ask your attention to some advantage of soft gold. Hill's stopping and tin foil respond too quickly to the wear and tear of mastication. Why does the farmer plug the tap-hole of his cider-barrel with a spile made of pine rather than hard wood? Simply because it makes no leakage. For the same reason a boat-builder stops up the holes made in his planks by the withdrawing of nails or screws with soft wood.

The plug must be softer than the material into which it is driven. When you put a soft foil filling into a tooth, you have these same conditions present. You will agree with me that it is not the most solid filling that preserves the tooth, but rather the one that is the best adapted to the inequalities of the cavity, especially the marginal walls,—the one which excludes air, moisture, and germs, and includes sufficient hardness to withstand mastication.

In all these requirements soft gold stands foremost. It is impossible to make as hard a filling as with the cohesive, though it will be dense. It is like putty, though you work it ever so long, when you have finished your labors it is putty still; you have not changed the character of the material. Again, the arrangement of the cylinders in a soft filling is more conducive to a perfect stop.

Will you bear with me while I describe briefly my

method of preparing and working the foil? I use Abbey's foil, Nos. 3 and 4, nothing heavier. Take a sheet and fold the edges together, once, twice, thrice, smoothly, making a ribbon of eight thicknesses of foil, about one-half inch wide, then roll or twist into a coil or rope, being careful to keep the surface of the foil smooth. Now with scissors cut into pieces just long enough to suit the cavity to be filled. By that I mean that one end of the coil shall touch the bottom, the other projecting just beyond the orifice. With your tweezers take up a piece of foil and carry it into one corner or angle of the cavity, cut end down, so the coil shall stand on end, condensing toward the distant wall. Using the side of your plugger, another piece is placed alongside, and still another, till you reach the other angle. The size of the cavity is now reduced. Repeat this operation till your last coil is in position. Now with the point of the plugger condense the surplus gold projecting above the tooth, keeping it well over the cavity. This is important. In condensing the gold you will find the weak places in the plug. Send the instrument well to the bottom of the cavity, using lateral wedging pressure. Fill up this pit and look for another. If possible, make these pits a little way from the enamel of walls, so as not to mar or grind the tooth under the instrument. Each piece of foil introduced in this way acts on the filling as the keynote to the arch, the filling being a series of arches. After this is gone through with to your satisfaction, use your burnisher, and use it thoroughly.

What becomes of it? Every piece of gold presents its edge or end to the action of the burnisher (shall I liken the filling to a bunch of asparagus standing on end?), and the action of the burnisher has forced, swaged, molded, or moved the mass in the same manner, but to a less degree, "than the warm burnisher does the gutta-percha plug," bulging the gold toward the walls of the cavity, filling up every inequality and securing for you a perfect stopping.

I start the filling with soft foil, working in the manner I have described, only taking more time to condense the gold as the use of the burnisher, which I emphasize so strongly, is prohibited; therefore the plugger is used a longer time.

A sheet of No. 3 cohesive foil is cut into four pieces, these pieces rolled into coils, each coil cut, making two or three short ribbons; pass one of these ribbons through the blaze of an alcohol lamp, taking care not to burn the foil. Some operators make a mistake in the use of heat. The less used, and sufficient to work your foil, the better. With the foil-carriers set it against the plug, and with rather a coarse instrument carry it across one edge of the filling; then, with a fine-pointed instrument, work it persistently; retrace your steps; add another coil, working on the former cohesive part, and overlap onto the soft filling slightly. The advantage of this method is a perfect weld. I have no difficulty in welding cohesive foil onto a soft filling, and never make a filling entirely of cohesive foil.

Soft foil can be used with a minimum loss of tooth substance, especially in proximal cavities of the incisors. I believe in the free use of files and chisels. Soft gold demands it, but the manner of working it by wedging enables the operator to fill without cutting a direct opening to the cavity.

The soft foil may be abused, yet can hardly change its character; but not so with cohesive; it responds quickly and resents every abuse. Virtue goes out of it at the first, and these conditions require a generous opening or channel, and often that is made from the labial surface. This result, while it caters to the vanity of a few patients, filling the heart of the operator with pride, is poor taste.

I do not think the art of filling teeth with soft foil an easy one to attain for it requires much time and practice, and the results are not so pleasing to the eye. In appearance they do not compare with cohesive work, but they have one strong virtue, they are honest, even better than

they look, as the fillings of Drs. Wetherbee, Pray and Johnson, done thirty, yes, forty, years ago, show to be. I have reached the conclusion that the man himself is greater than his school or methods, but I ask you not to let go of all the ancient landmarks. Instruct your students in the art of making soft foil fillings; there is merit in them. They are to dentistry what bread is among our food supplies.—C. H. GARRISH, in *International*.

ARTICLE VI.

TOOTHACHE: ITS DIAGNOSIS AND TREATMENT.

BY A. V. ELLIOTT.

The first and most important thing to consider when a case is brought before our notice is the diagnosis. To the patient who comes for relief, whatever the cause, it is to him simply a toothache and nothing more, and that is sufficient. But to us as diagnosticians it is of importance to know for a certainty the cause; whether, for example, it arises from irritation of the pulp of the tooth from exposure, or of the periodontal membrane, or because of some obscure pathological condition elsewhere. The diagnosis is not always easy. Ordinarily, when the patient presents for relief, we have little difficulty in discovering it. We find the cavity, and within it a pulp in a state of irritation; the proper remedy is applied, and the patient goes gratefully away. But sometimes we are embarrassed. There are crowns in every state of disintegration; root canals in all stages of putrescence and the development of gases.

Again, there may be no open cavities, but many teeth filled; no appearance of anything wrong, yet the patient suffers. The pain may come from exposure or near ex-

posure of the pulp through a prolongation of a cavity not apparent to the eye, or the pain may arise from a metal filling placed too close to the pulp without adequate protection, or it may be developed from incipient inflammation about the root of a dead tooth. Impacted wisdom teeth are frequently painful to the patient, or it may be osseous deposits in the pulp chamber and canals; or the pain might have its origin somewhere else, and is felt in a tooth through the reflex action of the nerves. Rheumatic, gouty, hysterical, and neuralgic people, and women during gestation are subjects of these irregular phenomena. It may be from different metals in contact, or near by, producing an electro-chemical action. Though this, perhaps, is more theoretical than real. I have never seen such a case.

In reducing diagnosis and treatment to general principles, let us commence with the simplest. Fortunately for us, these cases of difficult diagnosis are rare. The patients who come to us for relief are usually suffering from either inflammation of the pulp or of the alveolo-dental membrane. My plan is to remove the *debris* and decalcified dentine in the cavity, being careful not to wound the pulp, and then fill with oxyphosphate, leaving enough of the decalcified dentine over the nerve to protect it, after first sterilizing it with bichloride of mercury. If the pulp is exposed, or nearly so, I make a medicated soothing pad of eugenol, oxide of zinc and a few threads of Japanese paper or cotton. This I place next to the pulp, and, after taking up the surplus moisture from the pad with absorbing paper, fill the cavity with soft cement with as little pressure as possible. A cement which does not knead up softly should not be used.

If the patient has a violent and jumping toothache, aching persistently, especially at night in bed, I devitalize the pulp. I first apply something to reduce the pain. I prefer eugenol, as it seems to leave the pulp in a receptive state for the arsenic. The latter I prefer to other agents, because it leaves the dead pulp in a better state for re-

moval. At times we have neuralgia, but this usually disappears after direct treatment to the tooth.

Sometimes it is difficult to know if it is really a case of inflammation of the pulp, or if, it being dead, it is inflammation of the alveolo-dental membrane. The patient is feverish and apprehensive, and incapable of giving much assistance in the diagnosis. Test with cold water, watching the expression of the patient; if the pulp is alive there is generally no mistaking the fact, but it may be from an improper filling. Generally, where there is no marked indication there is no inflammation of the alveolo-dental membrane. We must search for cavities, and sound suspected teeth for tenderness. We must study the color of the gum, must interrogate the patient as to the symptoms, and when we find as a result of the examination that one tooth is more sensitive than others, and that the patient complains of a dull, heavy pain, and reports that the tooth seems to be longer than the others, and that drinking of hot liquids was painful, and cold not so, we may with confidence look for relief by boring into that tooth to give a vent to the confined gas. If the vent gives no relief by removing the pressure, we must "do all things to conciliate; failing in that, all things to crush." Toothache of this kind is one of the most distressing ills that human flesh is heir to, and owing to its situation and the nature of it, it is often difficult to give that speedy relief the patient longs for. Owing to the pain, and the absorption into the system of poison, constitutional disturbance is associated with the trouble.

The first thing indicated is to reduce the inflammation and prevent its further progress. If suppuration has not already advanced too far, blistering pads (I make mine of red pepper and cocaine, sewed up in little bags nearly covered on the surface with chlora percha, or strips of felt covered with wet gum tragacanth and pepper dusted over that; the gum softens in water, but does not dissolve), aconite and iodine, or strong iodine, can also be applied.

I recommend a hot foot bath, a dose of Epsom salts, and six-grain doses of antipyria, or apply leeches over the root. A lotion of cocaine, aconite, chloroform, and iodine, rubbed somewhat forcibly on the gum with the end of the finger, has a benumbing effect. Failing to get relief within a reasonable time by this, we must turn our attention to hastening the process of suppuration and the discharge of the pus. Hot poultices,* having two or three drops of landanum on each, should be applied, so as to assist the pointing to the right direction.

There are hopeless cases where the use of the forceps would be a mercy, and a possible insurance against much misery in the future. But judgment, qualified by honesty of purpose, should rule before the dentist yields to the suggestions of the patient and his own convenience, and extract a tooth that might be retained by proper treatment.

Erosion or wearing down of the crowns often gives rise to annoyance. The only thing to do is to cover with gold. Chloride of zinc gives temporary relief, and so does the nitrate of silver. But if the case be beyond filling, the nerve should be killed and removed. The same with erosion on the buccal sides of teeth, which is different from the other class. The solvent in this case must come from the mucous membrane directly opposite and in contact. Where all of the teeth seem to be sound, but their necks exposed and the gum in an unhealthy state, it is difficult sometimes to locate the pain. The patient himself is not sure of the tooth. Sounding gives no response, cold water sets all the teeth aching, as does cold air. Ordinarily, the pain passes away with the cause; at others it is persistent. The cause of it is exposure,—not enough covering over the cementum, which is not as thick over the nerve or as dense as dentine, and needs the further protection of bone and gum. Isolate the tooth giving the

* We presume the writer means on the gum. Poultices on the cheek are not admissible.—Ed. "Items."

trouble. Bore into the tooth, inserting a little eugenol, sealing up with gutta percha. This method has the advantage also of testing the tooth as to its vitality. Sometimes, where the destruction of tissue is very great, the only thing to do is to kill the pulp, after being sure of the right tooth. Exercise of patience and perseverance. I have recently had experience in being misled by sympathy. I had a toothache which, I thought, was in the left upper cuspid. I rejoiced at the idea. I wanted to experience clinically, on myself, the different phases and symptoms of toothache. I did not ask for sympathy, which is not usually given to dentists, but when I was unable to find any cause for the pain, and it was growing unbearable, I consulted my friend, Dr. Schaffner, who, not finding any trouble with that tooth, commenced sounding all the teeth on that side, and when he reached the wisdom tooth I responded. Up to that time I had no suspicion that there was anything wrong with that tooth.

In doubt, do too little rather than too much; be governed by general principles, and treat topically.—*International.*

ARTICLE VII.

A FEW HINTS TO STUDENTS.

BY WILLIAM RUSHTON, L. D. S., ENG.

Read at the Students' Society, National Dental Hospital, London.

Mr. President and Gentlemen:—It was with great pleasure that I acceded to the request of your secretary to read a paper to-night, because I thought that an evening might be profitably spent in thinking over and discussing a few points that crop up in every-day practice.

To many here these remarks may seem of a very ele-

mentary nature, but I hope they may bear them with patience, remembering that if it is good to "seek fresh woods and pastures new," so it is also sometimes good to "repeat a thrice-told tale." We are all students, and I hope we will remain so to our dying day. It is only fashionable young ladies who "finish their education."

Firstly, I cannot too strongly impress upon you the importance of cultivating a systematic method. Acquire the habit of going through a fixed routine upon every mouth which presents itself. The first thing to do is to ask the patient the reason of his requiring your aid, and then, by a series of intelligent questions, gain a rough idea of what is the matter.

After this has been done, proceed to examine the mouth in a systematic manner. A good rule is always to begin at the left upper molars, look out for caries on the crown, mesial, distal, and buccal surfaces; if you see an opaque white patch where two teeth meet, break down with a chisel without hesitation, though you may see no caries. Examine the bicuspid in the same way. Look out for caries in the canine on the mesial and distal surfaces near the gum, and erosion on the labial surface. In the incisors, in addition, examine the pit on the lingual aspect where the two ridges of the cingulum join, and so work round to the right upper wisdom. Also note which teeth are filled, whether any look like dead teeth, any signs of abscesses, pyorrhœa alveolaris, looseness or tartar. Then turning your mirror on to the right lower wisdom, come right round to the side you started from.

Now you have done two important things: you have learnt your patient's sensations, and you have made yourself acquainted with the tooth or teeth that may or may not cause those sensations; and it is in diagnosing differentiating and scientifically relieving that your skill comes in.

Three instruments should always be at hand in examining the mouth: the mirror, the probe, and the dress-

ing forceps, with cotton wool, or, still better, bibulous paper.

The mirror should be held in the left hand in such a manner that it reflects light on to the tooth under examination, and I may here remark that the mirror which has been scratched by corundum or disc should be kept only for such times as you are using corundum, disc, or pumice, and that for filling or examination purposes you should keep another and a faultless glass. Another point in the mirror is, that it should have a stiff handle. Those folding mirrors which I have occasionally seen are useless and vexatious; it is impossible to press away the cheek or control the tongue with them. I am told they are handy for the pocket; then by all means keep them in the pocket.

The dressing forceps grasping the cotton wool should be held in the right hand, and should accompany the mirror in its travels, clearing away saliva and mucus. Then lay down the dressing forceps, and go round each tooth with your probe, looking out for caries in the manner described. The dressing forceps will find out any caries that has made considerable progress, while the probe will find out the beginning of caries and hidden cavities between teeth. The probe is an instrument which should be used with great circumspection. If you plunge it into an exposed pulp, or into the gum, your patient is apt to lose confidence in your skill, and gentle treatment, and the possession of the patient's confidence is half the battle in dentistry.

Having asked your patient a few leading questions, and having examined his mouth, you can as a rule make a pretty shrewd guess as to what is the cause of his trouble.

Let us take a typical example of two.

A patient comes to us complaining of toothache. Toothache may be caused by any of the following :

Sensitive dentine, (a) caries.

Sensitive dentine,	(b) through erosion.
"	(c) metal filling.
"	(d) recession of gum.
"	(e) attrition.
"	(f) mechanical injury.
Irritation of pulp,	(a) through exposure.
"	(b) through the action of a filling.
Irritation of pulp,	(c) intrinsic calcification.
"	(d) mechanical injury.
Inflammation of pulp,	(a) through exposure.
acute and chronic,	(b) through a filling.
with or without	(c) through mechanical injury.
periostitis.	

Irritation or inflammation of the gum through the pressure of food or a filling.

Periostitis, through a putrid pulp or mechanical irritant, such as the bristle of the tooth-brush, etc.

Alveolar abscess.

Exostosis.

Painful eruption of wisdom-teeth, irritation or disease of the central nervous system, and, I daresay, some more which I have omitted.

So here we have a variety of causes for the disease on account of which our services are sought; it is our business to find out which of these is the enemy in each particular case, and to combat it.

Now, never do what I have sometimes seen students do—viz., find out a carious tooth and apply the rubber dam without asking a single question (and by applying the rubber dam, doing away with their patient's ability to answer questions) not knowing even whether the tooth is alive or dead. Before you apply the rubber, or start excavating, try and get to know all about that tooth.

Q. Where have you felt the pain?

A. The patient usually places a finger near the seat of pain; this may be a guide, but is not a criterion, as their feelings often misguide them.

Q. How long has the tooth hurt you?

A. For a fortnight, on and off; but it has been getting

~~more~~

Dr. Farrall

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dentine, save that which
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Dr. Farrall*

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a start of pain, means a live pulp, as the pressure is felt by the pulp through the spongy dentine. However, whether alive or dead, your duty is the same—to expose the pulp chamber. This must be done fearlessly, with sharp instruments and a bold hand; and while exposing, do so thoroughly, for the smaller the exposure, the more painful is the process of devitalizing, and *vice versa*. After two or three sharp strokes, you see a bright red spot from which issues more or less blood, and you know the patient has been suffering from an acutely inflamed pulp with periostitis. Your duty is of course to apply the rubber dam; if possible, though not if too painful, devitalize; extract the pulp later on, and fill in due course.

Let us take one more case. A patient asks you to remove an upper molar, you examine the mouth and come to the conclusion that the upper molar, though somewhat carious, is not the cause of the pain.

Q. Where do you get the pain?

A. It runs from that tooth right up the side of my face.

Q. Does it pain you at any particular time?

A. Yes; when I drink hot tea, and when I lie down at night.

Q. Does cold hurt you?

A. No; sometimes I hold cold water in my mouth and it eases the pain.

Q. You have a lower tooth stopped; do you have any pain from that?

A. I may have, but the whole side of my face seems so painful that I don't know where it comes from.

Q. How long ago was that tooth stopped?

A. Three months.

Q. Was it painful?

A. No, not very.

We tap the upper tooth with the handle of the mirror—no pain; we do the same with the lower, and the patient shrinks a little, but says the pain is nothing to speak of.

We get a large pellet of cotton wool, dip it in cold water, and place it on the filling, which is amalgam—no pain. We then get a large ball ended burnisher and place it in the flame till it approaches dull red heat. Then dry the tooth and place the hot burnisher on the filling. The patient does not feel it immediately, but in a few seconds says: "You have made it ache," or some such remark. Then you feel you are on the track, and at once proceed to drill out the amalgam. When this has been removed, you may find some pus oozing into the cavity. Perhaps you will think that as pus is present, you have a dead tooth to deal with and proceed to pass up a bristle or barb. If you do, you will wish you had not, for you will find that the lower end of the pulp only is dead, while the apical portion is alive. Thus we find that chronic irritation (perhaps present before the filling was inserted or produced by the filling) has been going on, getting worse, and suppuration has commenced. If the inflammation had been more acute, the pain would have been localized by the patient to the correct tooth, and there would have been most probably no wandering neuralgic pain, but very likely more periostitis.

We thus have taken two cases: in the first, we find how our patient may help us in our diagnosis; in the second, we see how they may at first misled us.

Always work with sharp tools. How can you tell they are sharp? Turn the edge towards the light; if you can see a line of light reflected from the edge, it wants sharpening till that line can no longer be seen. Have a stone by you and get into the habit of looking if your instrument be sharp, and if not, of sharpening it.

If you have the misfortune to wound a pulp which has never previously ached, dust immediately the wound with iodoform, varnish with copal, mastic, or carbolyzed resin, wait until the varnish is dry, and then flow on thin oxyphosphate. Never use gutta-percha in these cases, as the heat and pressure may be injurious.

If a pulp is sufficiently inflamed to give its owner a wakeful night, or even a prolonged pang of toothache, my rule is to devitalize.

White's nerve fibre, loosely twisted around a broach, is very convenient for devitalizing apices of pulps. It is always ready, easily introduced, easily withdrawn, and is efficacious.

I once put in a very satisfactory gold filling, and was surprised and annoyed to see my patient return in a few days with acute periostitis. I found it was caused by my carelessly leaving the ligature round the tooth after removing the rubber dam.

On another occasion, a similar incident occurred, and found that this time the periostitis was caused by my leaving too much gold in the filling, which was therefore gagging the mouth, and the tooth receiving consequently tremendous pressure.* *Verb. sap. sat.*

Mix (in ordinary cases) your oxyphosphate stiff. Thin fillings soon wash away. Have your tooth perfectly dry and ready. Mix quickly, always adding your powder to your liquid. If you find you have added too much powder, or have not enough liquid, never add more liquid, but start afresh. By adding the liquid to the half-set cement you alter the character of the preparation. Oxyphosphate mixed thickly and quickly and introduced at once has enough adhesive power for all ordinary purposes, it sets in a few seconds and forms a much more durable filling than those introduced in a "creamy" state. Do not touch your cement filling until it is set; then trim off, always working towards the edge of your cavity, never from it.

The golden rule for gold fillings is, "Take care of the edges (especially the cervical), and the middle will take care of itself."

I once asked a student whether he thought a certain cavity was of a proper shape to hold gold. His reply was, "It will hold amalgam." Now if a cavity is of a shape to

hold amalgam, it will also be of a shape to hold gold. There seems to be an idea among students that amalgam (being a plastic filling) adheres to the wall of the cavity after the manner of an oxyphosphate. Of course such is not the case, both amalgam and gold fillings are retained by the shape of the cavity. The details may be modified in each instance, but the fundamental rule is the same. If the same pains were taken over the preparation of cavities and their filling with amalgam as there is with gold, we should see less of failures in that respect.

No matter with what substance you are filling a tooth, pack it in bit by bit. I know of no exceptions to this rule, except perhaps pin-holes filled with gutta-percha. Gold, whether used cohesively or non-cohesively, must of necessity be packed in piece by piece, and (in reason) the smaller the pieces the better; the less likely they are to rock and the better they are to condense and cohere.

Amalgam should also be packed bit by bit. The best carrier I know is one of this shape, having a right-angled serrated end. Hold your amalgam between the tips of your thumb and index finger tightly, then press your carrier through the outside portion of the amalgam, and it then bears away a pyramidal mass which clings tightly to it. This can be turned upside down and carried to any part of the mouth; with mine I can fill a distal cavity in an upper wisdom tooth with very little more difficulty than a mesial cavity in a first lower molar.

Having taken a small mass of amalgam, place it in your cavity and burnish well with a small instrument into your undercut or floor, and so on, until the cavity is full, using a somewhat larger burnisher as you proceed. Finish off by absorbing excess of mercury with tin-foil or adding excess of dry amalgam and burnishing off.

In every operation upon the mouth (except extraction with forceps) use your instrument resting on your finger or thumb from a fixed point, the most useful fulcrum being a neighboring tooth or the tooth you are working

upon. By this means your hand is steady, you get increased power and you have perfect command over your instrument, which, if it slips, cannot slip far enough to do any damage. Are you chiseling an upper molar? Rest your index finger or thumb (whichever you are working from, the front or the back) upon the tooth, and grasping the chisel firmly with the other fingers, let it work upon the guiding finger or thumb, and while these latter are steady, your instrument is safe. The same rule applies to engine burs, excavators, and scalers, and in extraction with the elevator.

I have found that new students in purchasing instruments generally err in choosing them of a large size. These are useful in some cases, but always remember that, while you can get a small excavator or bur into a large cavity, you cannot get a large one into a small cavity; and in conservative dentistry small cavities are, or should be, the rule.

Never apply the rubber dam until you have roughly excavated and shaped the cavity, as you run the chance of wounding the rubber with your instrument, and so are obliged to re-apply it. By trimming your enamel edges, you obviate the risk of cutting your rubber and your ligature passing them up.

Gentlemen, this has been a rambling paper of odds and ends. I trust it has been of some service to some of you, but if it has no other effect than that of eliciting remarks and discussion, it will not have been jotted down in vain.—*British Journal of Dental Science.*

ARTICLE VIII.

APPLICATION OF THE RUBBER DAM.

BY THEO. F. CHUPRIN, PHILADELPHIA.

Read at the Southern Dental Association, 1892.

Mr. President and Gentlemen:

I do not know that the few scattering items which I offer can be classed under the appellation of a paper, but as your chairman requested the bringing out of anything new, I present to your consideration such items as have been suggested during the year.

Cases occur in practice almost daily where this invaluable adjunct of dentistry becomes useless, because it cannot be properly applied. As a typical case, let us suppose an upper molar to be extensively decayed on its mesio-masticating aspect, while the tooth is intact on its distal surface. The decay has progressed so far above the gum where the tooth is decayed, that in order to prepare the cervical margin the absorption of the gum is necessary. It is generally known that this may be effectually done by packing gutta-percha between the tooth where we wish to effect such absorption. But though we may effectually produce this absorption at the point where the tooth is decayed, the gum adheres to the neck of the tooth in its normal position at all other points, and if we wish to apply the dam in order to aid us fill such a cavity, we are thwarted on this account. To overcome this difficulty we proceed as follows:

Pack gutta-percha at the distal as well as at the mesial surface of the tooth; when the gum is thus forced away from these surfaces, remove the gutta-percha and mop gilling thread or ligature silk two or three times around the tooth, pushing this up well on the neck of the tooth; then tie and replace the gutta-percha at both proxi-

mate surfaces. Dismiss the case for a day or two, when the dam may be applied without the least difficulty, the gums having been forced well away by the gutta-percha at its proximate surfaces and by the ligature at other surfaces. Try it and rejoice.

THE OIL OF CAJEPUT AND GUTTA-PERCHA.

It frequently happens that there are cavities where the application of the rubber dam is inadmissible, and such cavities cannot be kept dry. Dr. W. H. Roop contends that by means of a very light film of the oil of cajeput, gutta-percha may be packed into a wet cavity and made to adhere; either for a temporary purpose previous to filling with gold, or for a permanent filling where the material is not subject to the attendance of mastication.

The cavity is prepared under such circumstances without wounding the gum, the cavity made as dry as it may be with any absorbent that is used, and a piece of gutta-percha just sufficient to fill the cavity is softened, and before it is introduced it is moistened with a film of the oil of cajeput, using no more on the pellet than what may be transferred to it from what adheres to the cork of the vial. To substantiate this Dr. Roop, at one of the meetings of the Pennsylvania Association of Dental Surgeons, procured a tumbler of water; he then softened a small pellet of gutta-percha, coated this slightly with a film of the oil of cajeput, and with an ordinary ball burnisher pressed this against the inside of the tumbler beneath the water. The gutta-percha adhered to the glass with sufficient force to not only hold its place, but to require some force to dislodge it.

Dr. Roop also presented samples of gutta-percha which softened readily by the hot-water bath, yet attained a sufficient hardness to enable it to be used on the masticating surfaces of the teeth.

ANNEALING GOLD FILLINGS.

Large contour gold fillings frequently get their corners

chipped or broken off by accident or by too severe use, yet sufficient remaining in the tooth as to only require an addition made to the remainder to restore it to its former condition. This was formerly done by drilling pits into the filling and starting the new gold from these pits. Several devices within the past year have been suggested to so anneal the gold in the tooth as to drive off all the moisture it may contain, when, by simply roughening the surface of the filling, fresh gold can be readily started on the defaced plug.

One of the least expensive, readily made and most effective of these appliances has been suggested by Dr. D. V. Beacock, of Brockville, Canada. It consists merely of a small glass pipet. This is filled with cotton lampwick, with the merest end protruding from the glass pipet; by placing this in a vessel of alcohol and pressing the rubber bulb and then removing the pressure, a sufficient quantity of the alcohol is drawn into the pipet to moisten the wick. The end may now be ignited, when it burns with a minute, almost imperceptible blaze. By using this carefully next the filling by degrees, the patient is not subjected to much discomfort, and the filling made so dry that fresh gold readily adheres to the old filling by simply roughening the surface.

The device was illustrated in the May (1892) number of the *Dental Office and Laboratory*.

NEUTRALIZING DECAYED DENTINE AND SENSITIVE DENTINE.

We have been very successful in overcoming sensitive dentine, in cases of exalted sensibility, by the use of a pencil of nitrate of silver applied to the decay. This agent blackens the surface to which it is applied; but when the cavity is prepared and shaped for filling, the discoloration does not seem to permeate to any considerable depth, so that it is entirely removed by the evacuating or cutting instruments, and the preparation of the cavity is almost painless.

We have also tried it to neutralize decay in large cavities in the sixth-year molars of children's teeth, where these teeth have had such large cavities that if all the decayed dentine were removed, an exposure of the pulp would be the consequence.

We applied the nitrate of silver in such places in powder, rubbing it into the disorganized tissue and filling over this with gutta-percha. As far as we know to the contrary, the operations have been successful.—*Southern Dental Journal*.

Editorial, Etc.

MEDICINE AS A CAREER.—The current number of *The Forum* publishes a paper on "Medicine as a Career" from the pen of Dr. J. S. Billings. The article is interesting to the general reader and is particularly instructive to dentists as it raises some points pertinent to the dental profession. Following are some selections:

To the young man about to choose a professional career, medicine at this time offers opportunities for the employment of the highest mental faculties, for the increase of knowledge, for usefulness to the world, and for the attainment of true happiness, as no other profession presents. It is not meant by this to assert that it will certainly secure to its followers all or indeed any of these things, but that, given the same degree of intellect with a good preliminary education, the probabilities are that out of a thousand men taking up the study of medicine more will attain success than will do so among a similar number of young men of like character and attainments who devote themselves to theology, law, politics, or education.

In speaking of a medical career as a means of obtaining such success the word medicine is used in its broad-

est sense to include the study of the phenomena of human life—disease and death—the circumstances by which these can be influenced, and the practical application of the results to prevention as well as to cure.

A professional man is defined as one who professes or announces that he is in possession of special knowledge such as the great majority of men do not have, and that he is willing to furnish the benefit of his knowledge to his fellow men in the shape of advice or supervision of certain of their affairs. The three learned professions offer such advice and supervision with reference to men's souls, property, and bodies; but, as Mr. Evarts has remarked, the field of usefulness is more universal for medicine than it is for law or theology, since there are many who have no property to be cared for and there are some with regard to whose possession of souls there may be a question; but every body has a body, which at times is liable to require skilled management to avoid suffering and death and to enable it to do its work, although some bodies, it must be confessed, are hardly worth preserving.

Consider the practical usefulness of medicine. It is not merely physical pain in individuals that is lessened or averted. Its results extend far beyond the man whose disability is removed, whose pain is diminished, whose death is delayed, and who is thus enabled to go on with his share of the world's work; they affect the welfare and happiness of his family, of his associates, and, it may be, the interests of a nation, or of the world of science, of literature or of art.

The relative influence of heredity and of environment in the production of the defective, dependent, and dangerous classes of society, of the feeble-minded, the insane, the deaf-mutes, the vagrants, and the criminals, the means of preventing such production or of dealing with them after they have been produced, are all medical quite as much as they are sociological questions.

The professional educator, from the teacher in a common

school to the head of a great university, has need of the information which the medical sciences are collecting with regard to the development of the organs of sensation, of memory, of comparison, and of judgment, which he is training for the coming generation, the men and women of the twentieth century; and with regard to the effects of variations in light, food, exercise, succession or order of studies, and many other things connected with school or college life upon the little masses of gray nerve substance which form the physical substratum of intellect, of emotions, and of morals. * * With a little change in certain cells of the cortical gray, a change which requires the use of the microscope to determine, the orator becomes speechless, the judge becomes a criminal, and the prudent man of business, the affectionate husband and father, the model citizen and pillar of the church becomes extravagant, unchaste, deceitful, and thus enters upon the first stage of a degeneration which, if unchecked, will make him a hopeless paralytic and a drivelling idiot.

I have said that a successful career brings to its pursuer the approval and friendship of those who best know his work, and this is pre-eminently true of practical medicine. * * Almost every reader of this paper knows some such man, in whose honesty of purpose, fidelity in keeping confidences, and readiness to undergo toil and trouble for the sake of his patients, all who know him have perfect confidence. * * Sweet are the confidence and friendship which come to him from those best qualified to judge of that part of his work which has been done rather for the benefit of the community, of science, and of the world than for individuals. These are for the most part, the members of his own profession whom he has helped. Some of them have been his immediate pupils; others, whom he may never see, have read his writings or have in other ways obtained help from his labors and express their appreciation of it in many ways.

The phrase "brother physicians" is one that applies especially in medicine, because for more than two thousand years in all civilized countries educated physicians have recognized each other as belonging to a brotherhood. * *

Thus medical men everywhere recognize the claim of a physician to advice and care in case of sickness or injury, and accept no fee for it. As Weir Mitchell says, "the physicians' guild is a world-wide guild, the only one."

It is necessary, in speaking of medicine as a career, to consider its demands as well as its inducements and these demands, for those who wish to secure such success as I have referred to, are for good mental capacity, for a long period of study, for much patience, for powers of physical endurance, for quick and keen sympathies, for honesty and for purity of thought, word and deed. In the hands of the physician are placed at times not only the issues of life and death, but of things more valuable than these. Not more than one man in a thousand can properly comply with these demands.

This done he will be ready to go to work, he will have some idea, though probably not an adequate one, of the things he does not know, and his advice and opinions will begin to be valuable. There is little cause to fear lest he do not find employment; there is always a place for a competent and trustworthy man, for one who can be depended on to work without supervision and to do more than the letter of his engagement calls for; and in laboratories, in hospitals, in medical schools, and in the broad field of practice there are such places waiting to-day for the men who have not yet been found for them.

This country is in no need of men possessing the diploma of Doctor of Medicine; it already has at least twenty thousand more of them than it requires or can properly support; but it does need several hundred, say a thousand, more of such properly-brained physicians as I have indicated, and I am quite sure that the people will be able to recognize them when they appear and will take proper care of their material interests.

My young friend whose attention I wish to direct to medicine as a career will have spent five years at a good intermediate school as a preliminary to entering the university.

which he does when he is about seventeen years old. He spends three or four years at the university, four years at a medical school, one and one-half in the hospital, and two years in travel and special studies. When, therefore, he is ready to begin work he will be about twenty-eight years old, and his education, living, books, etc., will have cost about eight thousand dollars from the time he entered the university. It can be done for less, but this is a fair average estimate. I am not considering medicine as a trade or looking at it from a commercial point of view.

THE ST. LOUIS DENTAL SOCIETY.

The annual meeting of the St. Louis Dental Society was held at the office of Dr. J. B. Vernon, January 3, 1893. The following officers were elected for the ensuing year:

President, Dr. DeCourcy Lindsley; Vice-President, Dr. J. Warren Wick; Cor. Secretary, Dr. William Conrad; Rec. Secretary, Dr. J. G. Pfaff; Treasurer, Dr. Henry Fisher.

Committee on Publication: Dr. L. A. Young, Dr. P. H. Isloeffel, Dr. C. L. Pepperling.

Committee on Ethics: Dr. H. M. Baird, Dr. A. J. Prosser, Dr. M. C. McNamara.

Committee on Membership: Dr. W. N. Morrison, Dr. C. L. Hickman, Dr. J. H. Spalding.

SPECIAL NOTICE.

The St. Louis Dental Society will hold a three days' clinic March 15, 16 and 17, 1893. A general invitation is given for all dentists to attend. The committee having charge of clinic already promise an interesting meeting. Drs. A. H. Fuller, J. Warren Wick, W. M. Bartlett compose the committee.

WM. CONRAD, *Cor. Sec'y.*

321 N. Grand Ave.

EDGAR PARK, D. D. S.—At a meeting of the St. Louis Dental Society, held January 17, 1893, the committee appointed to prepare a memorial and resolutions on the death of

Dr. Edgar Park, formerly an active member of this Society, submitted the following report, which was adopted :

IN MEMORIAM.

Died at Middleton, New York, August 12, 1892, Dr. Edgar Park, in the fifty-second year of his age.

Dr. Park was born in Wainfleet, County of Welland, Ontario, April 21, 1840. His family were English people. Up to the time of his leaving home, his education was only such as was obtained from the common or public schools. He left his home at the age of sixteen with but a scanty wardrobe and twenty dollars, bound for Texas. but, owing to his financial condition, stopped at Chicago, where he obtained employment, and by taking a course in Bryant & Stratton's Business College, made some advance in education and position. Through association with his uncle, Dr. Park of Chicago, with whom he lived, he became deeply interested in the study of medicine and attended a regular course at Rush Medical College. Later his attention was directed to the special branch of dentistry, and he adopted it as his profession, entering upon a course of study at the Ohio Dental College, in the year 1864, and graduating at the Missouri Dental College in 1869.

He was associated in practice with Dr. W. W. Alport of Chicago for a short time, after which he came to St. Louis and took a position as assistant to Dr. C. W. Spalding in 1865. In 1867 he became associated with Dr. H. J. McKellops, and remained with him until 1870 when he opened an office of his own. He soon secured a lucrative practice, and was highly esteemed socially and professionally. In 1873 he was happily married to Mary C. Fisk, an accomplished and lovable woman, daughter of General Clinton B. Fisk.

He continued the practice of his profession until March, 1884, when failing health compelled him to retire, and, after an illness of eight years, died at Middleton, New York, August 12th, 1892. His wife and five children (four daughters and one son) are left to mourn the death of a devoted and an affectionate husband and father.

Dr. Park was devoted to his profession, and was often

heard to remark that, "If I were worth a million, I would never give up the practice."

He was a progressive man, and ambitious to see the professional standard raised and honored; was foremost with those who labored to advance the profession by filling the ranks with honorable, capable men. He was a self-made man in every respect—a man of great natural resources and exquisite literary taste, and extravagantly fond of art, and always longed for the moment when he could have time and means to gratify his taste in this direction.

He was a devoted professional brother, interesting, sociable, kind and charitable, an active worker in the St. Louis Dental Society, always ready to do his share in whatever position he was called to act. He received the highest honors in the gift of the St. Louis Dental Society.

He was a member of the American Dental Association, and for one year Recording Secretary. Also a member of the Missouri State Dental Association. He was, at one time, a member of the Illinois Dental Society.

Dr. Park was a careful, painstaking, conscientious operator of acknowledged ability, and much of his work stands to-day as a monument to his skill.

WHEREAS, In the death of Dr. Edgar Park, our esteemed associate and active worker, the St. Louis Dental Society has lost one of its most worthy and honored members, a man of sterling professional integrity, full of generous impulses and kindly feeling, therefore be it

Resolved, that this expression of our regard and deep regret be spread upon the records of this Society, and that a copy be transmitted to the bereaved wife and family, to whom the Society tender their sincere sympathy. Also,

Resolved, that a copy of this memorial and resolutions be sent to the leading Dental journals for publication.

WM. H. EAMES,

A. H. FULLER,

WM. H. MORRISON,

Committee.

WM. CONRAD, *Cor. Sec'y.*

OHIO STATE DENTAL SOCIETY.

At the Ohio State Dental Society, held at Columbus, December 6-9, '92, the officers elected were as follows:

President, G. H. Wilson, Cleveland; 1st Vice President, Chas. Welch, Wilmington; 2nd Vice President, W. H. Todd, Columbus; Secretary, L. P. Bethel, Kent; Assistant Secretary, Henry Barnes, Cleveland.

Monthly Summary.

THE "HERBST METHOD OF TREATING PULPS."—It may scarcely seem scientific to oppose any special line of practice which is apparently based on experimentation by mere arguments brought forward in the absence of experiments. And yet we cannot forbear taking issue in the main with the practice of Dr. Herbst as outlined in a paper read by Dr. C. F. W. Bodecker before the New York State Dental Society. Briefly stated, Dr. Herbst's treatment of pulps is as follows: Cobalt is applied and allowed to remain from two to three days. Then the coronal portion of the pulp is amputated with a large round bur in the engine, leaving the root-canals filled with pulp tissue. Over this pulp stump tin or gold foil is burnished by means of a rotary instrument in the engine. Then the remaining portion of the cavity is filled in the usual way.

We cannot see any reason for believing that cases thus treated will be successful. In the first place, cobalt will *kill* a pulp. It does not simply paralyze the coronal portion, but it destroys it to the apex of the root. It accomplishes this just as effectively as does arsenic employed in the usual form. If Dr. Herbst would wait one or two weeks after the application, instead of two or three days, he would find the pulp as dead as the proverbial "door-nail." For more than a year we have used nothing but cobalt in our practice for the destruction of pulps, and its action is precisely similar to arsenious acid, with the possible exception that its application does not ordinarily cause pain.

We all know, or ought to know, the result of leaving the canals filled with the dead pulp tissue and filling over it. The use of corrosive sublimate, as recommended, would probably tend to prevent sepsis for a time—in fact, the prolonged use of this agent will mummify a pulp stump quite effectively. But even a mummy is not safe in the root of a tooth. As soon as it absorbs moisture through the apex it is a mummy no longer, and soon becomes an abiding-place of putrefactive germs.

It is our conviction that the dentist who follows this practice extensively will reap a lamentable crop of failures, and the chief danger lies in the fact that it is advocated by reputable men who have sought to prove its propriety by experiments. It seems to us that time enough has not elapsed to render the experiments conclusive in such a line of practice as the treatment of pulps. A dead pulp is a treacherous enemy. It will often lie in wait a long time before manifesting its malignity.

We wish to warn the more confiding members of the profession against this new method. We believe it will prove on a line with some of the other fads of the past—in truth, it reminds us strongly of the craze which struck some very reputable members of the profession years ago when arsenic was hailed by them as the desideratum for the treatment of sensitive dentine. We will draw the mantle of charity over the scenes of those days in offices where this practice was followed.

We hope that those who are disposed to look with favor on this new treatment of pulps will "make haste slowly." Mistakes have been made before.—*C. N. J. in Review.*

WHAT IS IRON MADE OF?—This looks like a very singular, not to say foolish question, and yet some chemists are beginning to doubt whether iron is really a chemical element. They think that instead of being an elementary substance it may be a highly complex compound, and that eventually means may be found of separating or isolating the bodies, or elements, of which iron is made up.

Different substances are ordinarily combined either by

simple intermixture, as oxygen and nitrogen are intermixed in the air, or by solution, or by chemical combination.

But it has of late been suggested that there may be a fourth state of combination still more intimate than that which is implied by the usual expression, "chemical union." The combination of yet unrecognized elements which make what we call iron would be an example of this fourth state.

What this conception necessitates may be judged from the fact that it seems to do away with the atom as the smallest elementary particle of matter. In other words, it has been suggested that "atoms may be smashed." "Smashing" the atoms of iron would, according to this idea, be a method of discovering the elementary substances that compose it.—*Youth's Companion.*

A CHANCE FOR EVERY TOOTH.—Sir Andrew Clark, President of the Royal College of Physicians and Surgeons, is said to have told Mr. Gladstone that he had one mouth but thirty-two teeth, and that each mouthful of food should receive thirty-two bites in order to give every tooth a chance. A correspondent of *The Youth's Companion* writes that he was recently cognizant of an excellent proof of the truth of this statement. He says:

A sallow-faced, unhappy-looking man came to Doctor B——'s office one day when the writer chanced to be present. He wanted some medicine for dyspepsia.

Among other questions, the doctor asked, "How long a time do you usually spend at dinner?"

"I dunno exactly," replied the patient: "ten or fifteen minutes, I guess."

"Does your food taste good?" Doctor B—— asked.

"That it does," was the reply, "but half an hour after I've eaten I'm near dying with distress."

"Do you drink much with your food—tea, coffee or water?"

"A pretty considerable amount," answered the man.

"Yours is a grave case," said the doctor, "but I can help you if you'll follow my directions."

Doctor B—— gave the man a dark-colored mixture in a bottle and said, Now, it is of the utmost importance that this medicine be taken properly. Put a teaspoonful into your cup of tea or coffee at each meal; stir it in thoroughly, and with each mouthful of food take a very small sip, and then

chew, chew, chew, in order to mix it completely with the food. Do this and report to me in a week."

Two weeks later I saw this dyspeptic again, but I scarcely recognized him, he was so much improved in looks."

"That medicine of yours works like a charm," he said to the doctor. "I've about forgotten that I have a stomach."

"That is good," responded Doctor B—. "Continue taking it in the same way for three months, and you'll be a well man."

Then, as the man went out, Doctor B—said to me:

"The whole story of that man's cure is in the word *mastication*. It is merely what I said to him—chew, chew, chew. But he wouldn't have believed it without the medicine, which was the simplest. The man was bolting his food, and I stopped it. I've cured hundreds of dyspeptics in a similar way. Indeed, most dyspeptics might cure themselves if they would give every tooth a chance—thirty-two bites to a mouthful, with two for every tooth missing."

LYSOL.—Attention having been drawn by the recent cholera "scare" to the popularity of carbolic acid as a disinfectant, notice is being taken in medical circles of the even superior advantages for many purposes of the cresols as disinfectants. It was discovered that crude carbolic acid made soluble by the action of sulphuric acid surpassed in germicidal power an equally strong solution of pure phenol, besides which creolin, although free from carbolic acid, was proved to be of unmistakably superior disinfecting activity to the latter. Being insoluble in water, however, these cresols were neglected until the idea was hit upon of combining them with resin soap. Although very efficacious, these preparations were only emulsions; and it remained for the cresols to be made soluble, as now in the form of lysol, in order that what can be called the ideal soluble disinfectant should be made generally available. Lysol is produced by dissolving in fat, and subsequently saponifying, with the addition of alcohol, the fraction of tar oil which boils between 190° and 200° Cent. It is a brown, oily-looking, clear liquid, with a feebly aromatic creosote-like odor. It contains 50 per cent of cresols; and it is miscible with water to a clear, saponaceous, frothing fluid. It shows turbidity when mixed with hard water; but its disinfectant quality is not impaired thereby. It acts, to all intents and purposes, as a soap; and it is admirably adapted for use in surgical operations. According to German testimony, lysol is one of the most precious products of coal tar which chemistry has given to the service of mankind.—*Scientific American*.

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No. II.

ARTICLE I.

OPERATION FOR RECURRING DISLOCATION
OF THE LOWER JAW.

In the *British Medical Journal*, Dr. Marsh, of Birmingham writes :

Mrs. A. O., aged 23, a stout, healthy-looking woman, was admitted into Queen's Hospital under my care on May 13, 1890. Five months previously, and a fortnight after confinement, she bilaterally dislocated her lower jaw when gaping. It was reduced, but in a fortnight's time was again dislocated by gaping. Since then recurrence has been frequent, some days happening many times—in fact, almost always if the mouth is incautiously opened. The dislocation is always easily reduced by her usual medical attendant, but if she is away from home difficulty is sometimes experienced, and the manipulation causes her considerable suffering. Restraining bandages had been worn, but the patient objected to them as a permanence, and was extremely anxious to have something done and was willing to submit to any operation offering even a chance of relief.

On May 15th, under anæsthesia the left temporo-maxillary articulation was exposed by an incision about an inch long, extending downwards from the zygoma, half an inch in front of the auricle. The capsule was opened and the interarticular fibrocartilage was found to be exceedingly loosely attached. The external lateral ligament could be clearly defined. Following Professor Annandale's method of fixing the cartilage in cases of subluxation, a catgut suture was passed through the periosteal attachment of the capsule to the zygoma and through the margin of the cartilage; but in tying it in the deep and narrow wound it cut through the cartilage; fine silver wire was substituted, twisted and cut off short. A second suture was now passed through the external lateral ligament and through the periosteal attachment of the capsule as far posteriorly as possible, so as to make a fold or tuck in the ligament and bind it down to the adjoining structures. The wound was then closed. It was anticipated that these sutures, assisted by the adhesions which would form during the healing process between the exposed part of the capsule and the surrounding tissues, would fulfill the first two aims of the method, and that careful asepsis would ensure the third.

Primary union took place, and in twelve days the patient returned home, wearing an elastic bandage to restrain movement, and for a time being limited to slop diet. She wore the bandage continuously for two months, and during this time there was no recurrence on either side. When she ceased to wear it dislocation of the right condyle soon took place, and became of frequent occurrence; the left remained in place in spite of extra strain thrown upon it during the manipulation for reducing the opposite side. The right articulation was therefore operated upon in a somewhat similar manner on September 25th, 1890, but only one silk suture was used; this was passed through the external lateral ligament, the periosteal attachment of this capsule on the outer side of the glenoid margin, the

interarticular fibrocartilage, back through the external lateral ligament, and then tied. Primary union again took place, except along a small drainage tube track, and the patient went home on October 8th, observing the same precautions as on the previous occasion.

Since the second operation there has been no recurrence of dislocation, and no trouble whatever has been experienced from the buried sutures. The cicatrices are hardly visible even on close inspection; there is a distance of $1\frac{1}{2}$ in. between the front incisor teeth when the mouth is open, and when the jaws are closed the teeth meet accurately. She can open her mouth widely or gape without fear, and can eat anything; she is, in fact, *re* the dislocation, perfectly well.

The operation, though apparently simple, is not a very easy one to perform. The wound must be limited in length because of the anatomical surroundings; the tissues cut through are very vascular, and it is difficult both to pass the suture, and to tie it sufficiently tight without cutting through the fibrocartilage. On this latter account aseptic silk or tendon will probably be found the most suitable material for the suture. In view of the possibility of suppurative arthritis and subsequent ankylosis, it is advisable to operate on one side at a time. The second operation should preferably take place soon after the healing of the first wound, and before the elastic bandage is discarded.

A sufficient length of time has now elapsed—over eighteen months since the second operation—to establish beyond doubt the permanent character of the result obtained by this method of treatment, the success of which has in this instance been so complete as to justify its employment in other similar cases.

ARTICLE II.**ON PUBLIC DISINFECTING STATIONS AND THE
USE OF STEAM UNDER PRESSURE
AS A DISINFECTANT.***

BY EUGENE F. CORDELL, M. D.,

**Professor of Principles and Practice of Medicine, Woman's Medical
College of Baltimore.**

With the increase in our knowledge of micro-organisms and the accumulating evidences of their widespread and baneful influence, there has been a corresponding increase in the attention paid to disinfection and in the realization of its supreme importance. Indeed, it may be said that the prevention and treatment of disease have largely resolved themselves into the discovery of agents which will destroy these insidious and deadly enemies of our health and lives, and yet be harmless to ourselves and not injurious to our property. One of the most important advances made in preventive medicine of recent years has been the passage of the law requiring notification of infectious diseases, and I desire, in passing, to commend the determination evinced by our health commissioner, Dr. McShane, to enforce this law—so essential to the health of our people and to the welfare of this community. By its aid alone can prompt measures be adopted for isolating the sick and disinfecting infected localities and articles.

There is no difference of opinion and none in principle, though details vary, as to the use of disinfectants in rooms which have been occupied by those sick of infectious diseases and for their contents. I have no intention of opening up a discussion of disinfectants generally, and the

* Part of Report of Section on Sanitary Science made to the Medical and Chirurgical Faculty of Maryland, April 27th, 1892.

Limits of this brief paper would not permit me to do so. I will only say that a thorough scrubbing of floor and wood-work with soft soap, scraping, if necessary, and white-washing the walls, hot white-wash perhaps being preferable to cold, fumigating the room with sulphur and soaking the linen, etc., in disinfectants and then prolonged boiling, are effective measures in proportion to the thoroughness and intelligence with which they are carried out. According to Rubner (who is Koch's successor in the chair of hygiene in the University of Berlin), all germs are destroyed by boiling in water for one-half hour; it requires twenty minutes to destroy the tubercle bacilli, ten minutes for the typhoid bacillus, and simply exposure to boiling water to destroy those of cholera and diphtheria. This must, therefore, be regarded as a mode of disinfection to be preferred whenever it can be employed.

But apart from the element of uncertainty as to thoroughness and the difficulties in the way in attempting to carry out such measures in private apartments, there are articles, such as mattresses, carpets, hangings, heavy clothing, etc., which could not, owing to their bulk, or other causes, be treated by them, or which might be injured by them. This leads us to consider what other measures are available.

Realizing our needs in this direction, most of the German cities (and it is to Germany that we look at this time for leadership in this field) have established central disinfecting stations, where furniture, bedding, etc., are subjected at public cost to the most approved modern methods of disinfection. England and France and other European countries have adopted the same measure, and some of our large cities are awakening to its importance. I deem it quite unnecessary to argue at length in favor of such a service in a city of the size and importance of this, with the authorities wide awake to all the advances in municipal government of the day, provided only the facts are duly appreciated. I shall endeavor briefly to describe what has

been learned and done regarding this most important subject.

It has long been known that heat surpasses all other agents as a disinfectant. At first it was supposed that a dry heat equal to that of boiling water would destroy all germs of disease. Then it was found that there were organisms which could withstand even a higher temperature than this—as the spore-bearing organisms, of which the anthrax bacillus was taken as a representative: it not being known at that time that the spores of this organism are exceptionally resistant, and that most other organisms—the tubercular, typhoid, diphtheritic, choleraic, erysipela-tous, and others—are far less tenacious of life. Even sulphurous acid, as we have learned, is only effective when applied in connection with steam, and yet this combination is particularly injurious to clothing and other fabrics. Dry heat is likewise injurious and does not penetrate through heavy materials. Steam heat is much less harmful than either and can be applied to the disinfection of most materials, especially if they be first heated to the boiling point by dry heat and dried again subsequently to the steaming. To Koch himself we owe the discovery of the great germicidal power of steam. According to all researches hitherto made, steam under pressure is the ideal disinfectant. No known form of life, either animal or vegetable, can survive a brief exposure to its influence. On this point all authorities are agreed.

What are the essential points, then, to be observed in the construction of a public disinfecting station? Such a station should be centrally and conveniently located, on ground isolated from dwellings and frequented places, and enclosed by a high wall. No other business should be allowed on or near the disinfecting works. The establishment should be under the control and management of the city authorities, or if the service be given out by contract, it should be strictly understood that no other business is to be carried on in connection with it, such as carpet

cleaning, etc. There should also be frequent and thorough inspection of the premises and procedure by a competent person. Separate vehicles and drivers should be provided for conveying articles from houses to the station; the drivers should be dressed in some distinctive garb, and the vehicles should be stabled to themselves. These vehicles should be air-tight and the articles should be placed in bags and taken through a window to them, not carried through the passage and hall-way. Such articles should be submitted to fumigation before removal from the house. After disinfection they should be returned to the owner by a separate conveyance and they should never be returned to infected apartments. The disinfecting building should be divided into two compartments by a brick partition, into which should be built the steaming chamber or stove. It should have a door of entrance on one side of this partition and a door of exit on the other side, so that materials once disinfected are not by any possibility brought in danger of reinfection.

The heating apparatus employed is usually cylindrical in shape. It is heated by a furnace or by Bunsen burners or gas-jets. The dome should be peaked or angular, so the steam condensing on its roof may run down the sides and not drip on to the clothing, etc. Steam is admitted by means of a pipe. It should always be introduced at the top of the stove and allowed to escape from the bottom into the opposite apartment. This downward current against gravity is considered very important, because the steam thus finds its way into every crevice and nook of the stove, which it might not do if it came in at the bottom and escaped at the top. The apparatus should be air-tight and should be lined inside with asbestos to avoid injury from contact of linen, etc., with the metal sides. The articles to be disinfected should lie on frames in the centre, or be hung up. Musty bedding and old clothes should not be introduced with new articles and fine linens, as the smell of the former, which is not destroyed by

heat, will be communicated to the latter and remain attached to them for a long time.

Having introduced the articles to be disinfected, the temperature of the chamber is raised to the boiling point (212° F.), so that the steam shall not condense on cold surfaces. The steam is then let in and continuously applied for a period of twenty minutes, which is long enough for ordinary purposes, or for thirty minutes at the maximum. The time element is of great importance because too long an exposure will injure certain materials. The temperature is assured by means of a thermometer, placed inside the bundle of clothing, etc., and communicating with a battery on the outside; by a simple device a bell may be made to ring when the desired temperature is reached; or a thermometer may be placed in the tube by which the steam escapes. V. Budde (*Zeitschrift für Hygiene*, Band VII, p. 269) deprecates excessive heating of the steam, as that interferes with condensation, which permits the powerful effect of the latent heat to be brought to bear upon the materials. Excessive heat is also objectionable, as stated above, on account of the possible injury to the articles. There is some difference of views as to the degree of pressure to which the steam should be subjected. Some of the most approved apparatus used allows of a pressure as high as 25 pounds to the square inch. The *London Lancet*, in the "Report of its Special Sanitary Commission on Disinfecting in London," January, 1891, refers with strong approval to the establishment of Mr. W. G. Lacy, formerly medical assistant at a London fever hospital, who disinfects for a large part of the city of London and for a great number of private houses, schools, etc., within a radius of twenty or more miles around London. The stove here employed is of great strength and the huge, thick, heavy door, which is screwed down, bulges out under the force of the high pressure. There is a safety-valve to prevent explosions. Even exposure to this tremendous pressure is not considered sufficient by Mr. Lacy, since it

only compresses the air in the thickness of mattresses, etc., and the moist heat will not penetrate these bubbles of compressed air. To break up these bubbles they are made to expand rapidly by letting off some of the steam and then turning on again more steam. This is the most powerful process of disinfecting known, for whereas dry heat and sulphurous acid, whether dry or moist, exert only a superficial effect, steam under high pressure will penetrate the heaviest mattresses and even more compact substances. Scientific experiments have shown that germs placed in the centre of a thick mattress are killed in fifteen minutes by it (*Lancet*, loc. cit.) Into such an apparatus it is not necessary to introduce separate articles, to open mattresses, etc.; the articles are put in canvas bags before being taken out of the infected room and introduced into the oven without unpacking. In consequence, a greater number of articles can be disinfected each time and the process is conducted with great rapidity. The stove of Mr. Lacy is exceptionally large, having a capacity of five cwt. The degree of pressure is determined by a simple manometer. Many consider that a pressure much below the above is sufficient—say two pounds to the inch. The President of this Society, Prof. Welch, tells me he is of this opinion, and in view of the great expense and risk connected with the high pressure apparatus, this opinion is entitled to careful consideration.

Mr. Lacy has also a stove for articles not requiring penetration, or susceptible to injury, as boots, books, mantel-piece ornaments, spring-mattresses, etc., and for articles that can be spread out so as to expose all their contents.

It cannot be denied that the establishment of such an institution involves great expense and requires a large force of specially trained employees; moreover, to conduct it requires a man of scientific qualifications—it certainly will not fulfill the purpose desired if entrusted to an ignorant or untrained person. Its advantages are incalculable,

and when we contemplate it in the light of modern knowledge and discovery it becomes simply a necessity. Certainly, should an epidemic arise in our midst—at any time a possibility—we should be in but a poor plight without it.

One important point is to be constantly borne in mind in order to make this or any other mode of public disinfection feasible, and this is, that the materials must be returned to their owners uninjured. Nothing will deter people from sending their clothes, etc., to be disinfected so much as to have them once sent back in a damaged condition. Some discrimination is necessary, therefore, in deciding what articles can be subjected to steaming; leather, stamped plush, skins and water-proof materials cannot; linen or similar materials will be iron-moulded if brought in contact with iron; grease should be removed beforehand, if possible, otherwise it becomes fluid and is liable to spread; blood and pus are coagulated and can be afterwards removed by chlorine or other solvents. According to Levison, fast-dyed materials are not injured. A lady's seal-skin jacket is not damaged by 240° F. Intermittent heating below 212° F. is advised for kid gloves. Other details regarding this part of the subject are given by Levison (*Zeitschrift für Hygiene*, Band VI, p. 225). Finally, the suggestion has been made and it carries with it its own recommendation—that there should be some place provided where poor people may go whilst their houses and clothing are being disinfected.

It may be well, in concluding, to consider what is being done in other cities, especially of our own country.

In Boston, in "scarlet fever and diphtheria," reliance is placed upon burning sulphur, nothing is said of other diseases. There is a building at the quarantine station where steam disinfection is practised. I have not learned further details.

In New York, disinfection is practised by dry sulphur fumigation; beds, pillows, mattresses, upholstered

furniture, etc., being cut open and contents spread out. Bedding or other removable articles are taken to the disinfecting depot on East River, where they are "thoroughly disinfected by hot air or steam, in an elaborate apparatus, especially constructed for that purpose."

In Washington City, the room where a patient has been ill with scarlet fever or diphtheria is thoroughly disinfected by exposure for several hours to the fumes of chlorine gas, or of burning sulphur. All clothing, bedding, carpets and other textiles which have been exposed to the contagion are required to be either burned, exposed to super-heated steam, or thoroughly boiled.

Fumigation with sulphur is practised, and it is stated that "the owners of a private establishment for the renovation of carpets, bedding and other textiles, have constructed, in an isolated place in the District, a separate tank for the cleansing of articles that have been exposed to infection, by super-heated steam and naphtha."

At the quarantine stations in Charleston and New Orleans, steam heat is employed and the methods and apparatus seem to be very thorough.

In London the methods vary; the city authorities prefer sulphur fumigation, but the use of steam-disinfection is growing and the large stove of Mr. Lacy above mentioned "disinfected for one district alone more than nine tons of articles during the Christmas quarter." The district of St. Pancras has built for its use a stove which is an exact copy of Mr. Lacy's. A number of districts employ Lyons' steam pressure stove, which is much smaller, so that two are sometimes required.

In Germany, there is more uniformity in practice, and the principles which I have endeavored to explain and recommend are there carried out with the highest degree of efficiency. A useful addition to the so-called refuges in Berlin is the bath which can be taken by persons whilst waiting to have their clothing disinfected in the adjoining steam-chamber. In Cologne, for economic reasons and to

give employment to stokers and others temporarily out of work, the apparatus is connected with the steam laundry of the city hospital. The schimmel apparatus seems to be very popular in Germany.

In Paris there are three public disinfecting ovens, and the service is carried on with all the precautions I have narrated above.

Moscow as yet has only a sulphur fumigating establishment. I might give further details collected in my investigation of the subject did time permit.

In this city the measures pursued for disinfecting apartments and their contents correspond with those usually employed, but in a circular entitled "Suggestions for Preventing the Spread of Scarlet Fever," issued by the Board of Health, I find the following: "Most articles may be disinfected in a room if hung up loosely and exposed to the fumes of sulphur, though it would be an additional safeguard to expose anything thick, like a bed-mattress, to prolonged heat at a temperature of about 240° F.; and indeed, *heat* or steam must, with our present knowledge, be considered *the best disinfectant*." (Italics in original.) That our present efficient Health Commissioner is alive to the importance of the considerations which I have urged above, appears from the fact that last fall he secured permission from the city authorities for the erection of a frame building for fumigation. This building adjoins the morgue and is under charge of the keeper of the morgue. It consists of two layers of boarding filled in between by four inches of saw-dust, so as to be as air-tight as possible, and has a capacity sufficient to admit a hack. About three pounds of sulphur are used for each thousand cubic feet of space. It has been in operation now since about the middle of November and a large quantity of bedding and bed-clothes have been disinfected there. Twelve to fourteen hours are deemed sufficient time for exposure of the articles to the sulphur fumes. While from the facts presented above this arrangement cannot be considered sufficient, it is a step in the right direction and will doubtless lead in no great while to more efficient methods.

ARTICLE III.

MECHANICAL ABRASION OF THE TEETH.

BY JUNIUS E. CRAVENS, D. D. S., INDIANAPOLIS, IND.

Read before the Ohio State Dental Society, December, 1892.

After completion, the crowns of teeth are subject to such modifications only as are destructive to contour. Aside from decay, these modifications are usually known as abrasions, and are classed as mechanical and chemical, so called. This paper is devoted to a study of mechanical abrasion, because it is observable to some extent on every set of adult teeth that are in occlusion. Mechanical abrasion should not be confounded with conditions arising from blows, violence of sudden occlusion, as in snapping the teeth, or any of those accidental coincidences that crack and break away fragments of tooth-crowns. All modifications that should be classed as simply abrasions are accomplished by a gradual wearing away of the hard tissues of the crown, whether classed as mechanical or chemical abrasion. Usually, mechanical abrasion is confined to those parts of a crown that are, or have been, in occlusion with teeth of the opposing maxillary. Mechanical abrasion is confined to those parts of a crown that are, or have been, in occlusion with teeth of the opposing maxillary. Mechanical abrasion is essentially progressive, and presents three well-marked stages for consideration—each having characteristics that are well worth the attention of the practitioner.

PRIMARY ABRASION.

The primary stage is confined to the enamel, which is worn off in small, flat and highly polished surfaces, consequently, in this stage, the abraded tracts are colorless and without sensibility.

Careful observation of cases as they occur in daily practice has led the writer to a recognition of the following propositions:

First: The primary stage of mechanical abrasion is the accomplishment of complete occlusion; and—

Second: Either condition is impossible without the other; therefore—

Third: The primary stage of mechanical abrasion is not detrimental to the use or tenure of teeth; to the contrary—

Fourth: It is essential to a proper and most effective exercise of the teeth in mastication.

It is much to be regretted that the process of mechanical wear of the teeth does not cease with the establishment of the primary stage.

When a tooth is erupted, it is then perfect—if ever perfect—in contour, and to be perfect in contour means to present certain angles and curves that render impossible that adjustment that must be mutual between teeth—that we style complete articulation—without some abrasion of the occluding surfaces. The practical impossibility of frequent, forcible contract of equally hard substances, without some abrasion of both, must always be considered in mechanical adjustments that are designed to be persistent. Dentists who fail to recognize and provide against possible destructive force of occlusion, primarily—emphasized by inevitable mechanical abrasion, secondarily—are certain to experience a liberal per cent. of failures in their operations.

SECONDARY ABRASIONS.

The secondary stage is produced by a continuation of the wear that begins with the first stage; but in the secondary the abraded tracts are observed to have notably broadened, and are depressed centrally so as to appear as distinct saucer shaped facets, sometimes attaining great depth; they are usually discolored—varying from yellow to a

coffee-brown. It is characteristic of animal ivory, from whatever source, to become discolored by exposure to air and moisture, and general surface contamination; in abraded tracts on teeth it is observed that the deeper the discoloration the less the degree of sensibility; however, their effect often is only superficial.

When abrasion has progressed until the cusps have been reduced to their bases, the tracts of exposed dentine hang like sagging canvass from the enamel that has been left standing as an elevated rim around the exposure, as if for protection. This elevation of rims of enamel about abraded tracts constitutes a distinguishing and important feature of advanced abrasion, and should be noted.

Unlike the primary stage, the second involves two of the hard tissues of the crown in its destructive progress; in no sense is it essential to complete articulation of teeth; in fact, it often destroys established articulation and continues without discernable contact. However, the secondary stage, although undeniably erratic, marks a degree of progress in a transition by which man, in decline of life, comes to use his masticators much after the fashion of a goat.

Secondary abrasion is not altogether without redeeming features; it certainly admits of a more liberal lateral action of the jaw; facilitates prehension and accommodates retraction in occlusion. Further, as this stage does not obtain until the individual is nearly or quite fifty years old, it is largely instrumental, by virtue of a shortening of the visage, in giving to the features that expression of manhood or womanhood that so often is an index to the character, and that fixes itself indelibly upon us for good or evil, until the softening snows of the winter of life come to take away the settled look of business and cares; and then the man is old.

TERTIARY ABRASION.

In the third stage of mechanical abrasion, we discover the extremely worn-out condition of the teeth, so char-

acteristic of old age, or, at least, beyond middle life. In many instances, that which usually should be an articular surface, has been reduced to a single deep depression, touching—if at all—at the sides only; this is often observed in the cuspids and incisors. In many cases of abrasion of the molars there remains of the grinding portion, the vertical rim surrounding the abraded tract and standing up in relief, while the central portion is occupied by an irregular ridge of enamel—the remaining evidence of grinding surface fissures. Here we have a practical completion of the transition referred to in closing observations on the secondary stage, by which man in the “sear and yellow leaf” is relegated to the herbivora; let us hope he may not become quite an ass. With the angle of his jaw nearly straightened, his teeth notably shortened by abrasion, the cusps of his youth worn entirely away, and circular and traverse ridges of enamel rising like those of the horse to perform the manual of mastication, we observe the “lean and slippered pantaloon” comminuting his food into meal with his teeth, instead of bruising and triturating it in saliva as in the days of his cusps; that which he can not chew he eschews, so that gradually he accommodates himself to a diet in which slops, eggs and tender vegetables predominate or dominate.

To the aged it is a blessing that they are enabled to manipulate a worn-out mechanism of mastication so effectually as to enjoy fair digestion. Thus we come to comprehend that although the tertiary abrasion is so disastrous to the teeth themselves, it renders perhaps reasonable compensation in enabling the sharp edges and ridges of enamel to meet the deficiencies of muscular weakness and impaired digestive power.

Again, in the third stage, it becomes a matter for regret that the progress of wear of tissue may not be stayed; but the fact of continual wear here is as merciless as in the preceding stages; the crowns disappear, and the subject continues to chew—or thinks he does—after a

fashion, with such poor stumps as may have been spared, until at last all are gone, and the edentulous gum of infancy is almost reproduced in "second childhood." Still the compensating kindness of Nature is asserted, and the gums become so toughened as to prove effective in bruising such articles of diet as are appropriate to that stage of existence; an intimacy of the nose and chin is threatened, and the countenance of the individual whose "sands of life" are run so low, assumes the angelic expression of one who has realized the hollowness of life's ambitions and appetites, and fixes an expectant gaze upon eternity.

The density of enamel enables it to offer a greater resistance to abrasion than dentine is able to do, otherwise the wear would be uniform, and the teeth would become flat and smooth, offering no advantages as grinders. The dentist should consider well the consequences to the patient in his hands, ere he proceeds to level up the saucer-shaped depressions in the grinding aspect of molars and bicuspid of the middle-aged or aged; likewise there is here a suggestion to be applied to prosthetic practice.

AGE ESTIMATED BY ABRASION OF TEETH.

In most cases the approximate age of a subject may be estimated by the stage of abrasion of the teeth. The first stage (enamel wear) is found as early as eighteen years, and even earlier. The second stage should be well marked at fifty, and often noted by forty years. The third stage (extreme wear) is nearly always apparent at sixty years. Habit often has much to do with abrasion, and an individual's teeth may thus be made to indicate much greater or less age than the fact.

Whether a problem is presented herein, or not, depends upon the "point of view," and some other things.
—*Cental Register*.

ARTICLE IV.

PYROZONE.

The medicinal pyrozone is an aqueous solution containing three per cent. H_2O_2 , which represents fifteen volumes of confined gas.

The former so-called fifteen-volume solutions are now claimed to be but ten volumes.

The range of use for this 3 per cent. pyrozone is similar to that in which the ordinary peroxide has been employed.

In this connection, I would like to say that diluted peroxide is often prescribed, and that I have never used it with any satisfaction when diluted, but always use it full strength.

Medicinal pyrozone is a good bleacher, but less penetrating in its effects than the stronger preparations.

The antiseptic pyrozone, containing 5 per cent. H_2O_2 , or twenty-five volumes in ethereal solution, seems to be more generally serviceable in dentistry. The caution should be noted that concentration follows on evaporation of the ether. Thereby the antiseptic strength in time may become caustic. The effects of the 5 per cent. and of the 25 per cent., or caustic solution, are so similar in general character, that with the statement that the 25 per cent., in most instances, is caustic, though not in all, an indefinite description as between the two will serve as an outline of the observations that have been had on these oxygen conveyors.

These ethereal preparations are neutral, and, though they decolorize litmus paper, it is by bleaching through the action of the oxygen on the organic coloring matter, not a reaction caused by acid.

They are inflammable and volatile. The first use made of them by me was in the bleaching of teeth. A

pledget of cotton soaked with pyrozone, 5 per-cent., was placed in a cavity, and the surface of the tooth wiped with the same strength. It produced a very considerable bleaching effect in a pulpless right superior first bicuspid. This 5 per cent. strength has been used to remove the brown or green stain about the necks of children's teeth, care being exercised that the fluid does not touch the gum.

As a bleacher, pyrozone is (by its makers) advised to be used after applying an alkali.

Pyrozone alone bleaches teeth well. Whether it is a solvent of the organic substance of the tooth, or whether the chemical constitution of the tooth, being mainly alkaline, furnishes the basis for its activity, remains to be shown. Its application on soft tissue produces a bleaching effect strongly resembling an eschar. This progresses slowly after application, therefore caution should be exercised to give full time for this characteristic appearance before further application. The white, apparently coagulated surface resumes a pink tone slightly lighter than before the application of the pyrozone.

The change occupies from a quarter to one minute in whitening the surface, according to the character of the inflammation. The more the inflammation approaches suppuration, or the greater the congestion, the more rapid is the action of apparent coagulation. The fading of the white color occupies five to ten minutes.

Pyrozone in all strengths is a prompt hemostatic, though because of the caustic effect sometimes produced by both the stronger ethereal solutions, the 3 per cent. will probably best serve this office. Pyrozone acts more promptly on moist surfaces than on such as are dry. In a case of pyorrhea alveolaris, suppurating for eight months previous to treatment, the suppuration was controlled after one application of caustic pyrozone (25 per cent.) on all of the teeth except about the transverse processes between the right superior central and lateral, and the left inferior central and lateral. The processes themselves had soft-

ened, and will require further time to become restored to health. In this instance the caustic pyrozone caused a surface coagulation under which, or through which rather, the gas seemed to be liberated continuously, producing a crepitous sensation on passing the finger over the surface. This crepitation gradually subsided, the confined gas seemingly being given off through the external coagulated surface.

The color (white) fades more rapidly from the normal surface than from the abnormal, and as a diagnostic help pyrozone, 5 per cent., seems to have possibilities. Liquid alboline, benzoinol, or other *mineral-oil* product, as vaseline, will be found palliative to the prickling of the caustic.

It was intended to make some observations on phenata of cocaine, but the clinical opportunities ought for pyrozone have somewhat eclipsed the phenate. However, for the present it must suffice to state briefly that as a local anæsthetic for extraction, congested pulps, and in opening abscesses, it has proved a valuable aid, entirely subduing pain without injury.

The continued use of pyrozone has intensified the statements made, and with reference to the 5 per cent. or antiseptic pyrozone it has been found especially efficient in two somewhat grave cases, one of necrosis where the external plate of the alveolus of the inferior maxilla had been (in extraction) ruthlessly separated from the symphysis to the angle, the teeth of the entire lower denture having been ordered removed by a physician, who had externally poulticed an abscessed right inferior first bicuspid. Marchand's medicinal peroxide was also used in comparative tests with pyrozone (3 per cent. or medicinal), by injection in the sinuses. The resulting froth was in every instance thicker and more abundant with the pyrozone 3 per cent. than with the Marchand peroxide. This seems to indicate that the claim made by the maker of pyrozone 3 per cent., that their preparation is fifteen volumes and Marchand's but ten, is true. The abnormal tissue

sooner returned to health, and the suppuration more rapidly ceases under treatment of pyrozone 3 per cent. than under Marchand's peroxide. In a case of severe ulceration of the left cheek, starting about the orifice of the duct of the parotid gland and extending to and slightly posterior to the condyle of the upper maxilla, the 5 per cent. strength of pyrozone has been employed in comparative tests with salicylic acid (saturated solution in alcohol). The pyrozone produced at first considerable pain, which rapidly subsided, leaving a clean non-suppurating surface. The salicylic acid produced pain for nearly six hours, and left a coagulum which in three days peeled off, leaving a tender surface with isolated spots of suppuration. The reduction in the depth of ulceration in both applications was evident, but the early relief from pain and the absence of the coagulum with the pyrozone 5 per cent. indicated it a preferable stimulant and antiseptic.

The great principle of cure is to remove abnormal conditions as nearly as possible, and let nature make the cure. In a general way, keep the body inside and out *clean*, and it will be healthy. The oxygen seems to effectively accomplish, and the apparent absence of all danger in its use places it in an enviable relation with other corrective agencies.—DR. C. B. ATKINSON, in *Cosmos*.

ARTICLE V.

ANCHORAGE OF GOLD FILLINGS.

BY DR. S. B. PALMER.

The ideal filling is one of cohesive gold throughout, well contoured and anchored in firm tooth structure. These happy combinations are not always present, thus the requirements must be met by combinations of other preparations. It is true that a few skillful operators claim to ac-

comply all that is required with cohesive gold alone. Allowing this claim, there is a waste of energy for the operator, and needless strain on the patient without corresponding benefits. One thing should not be lost sight of which is a fixed law in nature: that a metal filling in the mouth exerts an electro potential influence to decompose the fluids that may be between the filling and the walls of the cavity, or in the dentine itself when that is much below normal density; this decomposition is according to the conductivity of the plug and its powers to resist oxidation. Thus gold, being the best conductor and non-oxidizable, acts with greater persistency than tin or amalgam. Let no one be deceived, and make a mistake in trying to circumvent this law by perfect manipulation without a cavity lining which will exclude moisture.

Though cavity lining is not anchorage, it has much to do in laying the foundation for fillings. Your attention is called to a few specific cavities and conditions of dentine, with recommendations for treatment in starting fillings:

First. Assuming that an accessible cavity is properly prepared in dentine of normal structure, with undercuts or angles so that the first piece of gold inserted is held firmly, and on which every other piece is made to cohere till the plug is completed, no finer filling can be produced, in appearance or for tooth preservation, and thus credit is given to all who can do this superior work.

Care should be taken not to drill deep anchor pits into the vital dentine, as formerly practiced; much harm has been done by or through the thermal changes thus introduced.

Second. Foundations of soft gold for cohesive plugs.

A large portion of gold fillings are done in this manner, and probably each operator has a method which suits him best. The one which best answers my purpose is to commence with one or more cylinders. Without describing the kind of cylinder recommended, we might as well

say pellet; there is nothing in the market that answers the purpose, and we may better give a description how to make cylinders now than later on.

Ney's No. 4 foil is best adapted for cylinders, on account of the roughness imparted to it by the book paper under pressure. Smooth foil makes cylinders too hard. The leaf may be cut into half, third, or one-fourth strips, the ribbons folded to a width according to the depth of the cavity. Cylinders should be kept on hand, and the selection made as required. The narrow strips are rolled around a broach, or better, a three-sided point attached to a firm handle; when the roll is drawn from the point, the ends should be slightly pressed with pliers.

Let us now consider a cavity, medium or large, located in the grinding surface of a molar, surrounded by firm enamel borders; bottom of cavity left flat or concave. If the dentine is firm and dense, the cavity is ready for the gold; where soft and sensitive, yet firm enough to warrant filling, varnish the cavity with some quick-drying varnish. I am using Canada balsam dissolved in chloroform. Without waiting for the varnish to harden, line the bottom of the cavity with a piece of gold foil of two or three thicknesses; on this lining place a cylinder which will about fill the orifice of the cavity. If too large, compress; the length of the cylinder may be one-half or two-thirds the depth of the cavity. Then commence with cohesive gold; every piece introduced remains firm and is driven into the folds of the cylinder, condensing and expanding laterally every portion of the plug at the base by lateral pressure against the wall of the cavity, and the anchorage is perfect.

Third. Proximal cavities in molars or bicuspid, extending from the cervical border to the grinding surface.

Contour fillings. Matrices well adapted to this class of work are made of rolled aluminum, wide enough to extend from the gums to one-half the length of crown, and beveled to knife edge. Insert the matrix of suitable thick-

ness, and bend the ends away from the cavity, thus giving full view of and access to cavity. The matrix is used only to prevent the first pieces of gold from falling out, and not to mold the filling. The cavity being in readiness, the portion next to the gums only should be varnished, as any such coating on enamel or even dentine prevents the mechanical bite which gold has on enamel without varnish.

Select a cylinder smaller than the cavity, but longer than its depth; carry one end of the cylinder into the cavity, and force the outer end toward the gum on the incline made by the knife-edge matrix. When the cylinder has been firmly pressed to the cervical border of the cavity, another cylinder may be placed by its side, or one on either side, and packed as before; thus a firm and broad foundation is laid, on which cohesive gold may be packed to finish. When done, one end of the aluminum is bent straight, and the piece drawn out by the other end. When the projecting ends of the cylinders are condensed and the plug finished, no portion of the filling will be more perfect than at the cervical border.

Fourth. Condition same as the last described, except the cavity extends beneath the gum. A case from practice will illustrate :

A patient, while absent, had occasion to have a bicuspid filled; the cavity extended beneath the gum. The dam was applied, and two unsuccessful attempts made to fill with gold; the patient returned with a phosphate filling. Examination showed it useless to apply the rubber. The cavity was prepared, and filled with amalgam to the cervical border; the remainder was filled with gutta-percha, and the patient dismissed. At the next sitting, the amalgam was cut down for a foundation, the rubber applied, and the tooth filled with gold. One year's time shows no discoloration from the amalgam.

Fifth. Cavities on buccal or labial surfaces, extending beneath the gum, making it difficult to apply the rubber, especially the shallow, crescent shaped cavities in centrals

and laterals. Prepare the cavity with no more depth than is necessary to remove the softened dentine; let the margin be distinct, and walls at right angles with the bottom of the cavity. Protect the teeth with a napkin or paper; also fill with bibulous paper between the teeth on either side of cavity. Dry thoroughly the cavity and gums exposed, and varnish both cavity and gum, allowing the varnish to pass beneath the gum where there is space, which will prevent ingress of moisture by capillary attraction. Line the cavity with crystal gold; first go around the border of cavity, then build across till the cavity is lined with a basket of gold; on this foundation a solid gold plug may be anchored of any cohesive gold without danger of its falling out or of decay around it.

This method is the same as given by Dr. Howard in a clinic at Rochester, and it more than meets his claims in filling the porous dentine, whereby fluids are excluded and secondary decay prevented. With a little practice, filling is made easy with this class of cavities.

Modification and adaptation of the principles here laid down will meet all conditions of anchorage for gold fillings; nor is this preparation of foundations less valuable for amalgam, gutta-percha, or phosphate fillings. Indications for use of varnish under oxyphosphate are sensitive dentine or near approach to the pulp; no acid excitement is experienced with this cavity lining.

Under gutta-percha it is valuable in fastening the filling to the walls of the cavity under conditions unfavorable for exclusion of moisture, as each piece of filling remains fixed in the cavity. It is true chloro-percha and some of the essential oils also cause the filling to adhere, but the lining is much softer and yielding than varnish. In connection with amalgam, it may be used, as with gold as a lining for cavities where poorly calcified dentine must remain as a pulp covering; also in cases where dependence is placed on oxidation to fill the dentine. So far as I can determine, this answers the same with much better appear-

ance. Amalgam fillings inserted in heavy varnish remain bright on the surfaces in contact with the cavity walls which is not the case in many amalgams touching dentine.

Again where there is no action on the metal, there is none on the dentine. Thus amalgam which contains no copper may be used with equally good results, without discoloring the teeth.

In conclusion, science teaches that the result of every operation in filling is the outcome of principles laid down in the foundation and observed to completion. Whatever is success at any time will be for all time, under the same circumstances and conditions.

Progress is based on the knowledge and amplification of principles leading to better methods. Thus we are stimulated in search of more knowledge and higher attainments.
—*Cosmos*.

ARTICLE VI.

ASBESTOS FIBER IN ROOT-CANAL TREATMENT.

The use of liquid or semi-fluid substances for root-canal dressings or fillings is rendered extremely difficult in the superior teeth without the assistance of some fibrous material which acts as a carrier or vehicle to overcome the effect of gravitation, and so secure the placing of the dressing fully to the apex. Cotton wool, silk, or lamb's wool, and in fact all of the fibers used in this connection, present the uniform objection of inviting the absorption of secretions through their porosity, and by reason of their organic origin of developing a tendency to putrefactive changes with resulting irritating effects on the perice-

mental membrane. For the past two years I have used with much satisfaction for the purpose under consideration, a long-fiber Canadian abestos, which is to be had from the dealers in abestos materials. It should be obtained in its native condition as rock abestos, not separated into the fine woolly condition by the mechanical processes used in preparing it for commercial purposes. The best variety occurs in irregular masses, deep emerald green in color, with a fine striated structure in which the fibers are in bundles from one-half to two inches in length. For use in pulp-chambers, the fiber is readily obtained from such a mass by holding it in the left hand and rubbing off a sufficient quantity in a fine silky condition by using the ball of the right thumb applied at right angles to the length of the fibrous mass. By rubbing it in this manner for a short time a flock of extremely fine fiber will be obtained, which can be twisted into a suitable wisp, having great tensile strength and a certain rigidity which enables one to readily carry it, even when moistened with a medicament, to the apex of the canal. The material described has certain marked advantages over any other fibrous material in common use for the purpose—viz, it is inorganic and undecomposable by any of the substances ordinarily used for pulp-canal treatment; it is unaffected by the ferment agents there present; it is by reason of its non-combustible character readily and instantly sterilized by passing it through an alcohol flame and heating it to redness; it makes a suitable and, unalterable vehicle for the application of tincture of iodine, potassium permanganate, nitrate of silver, sulphuric acid, or any of the agents which disintegrate cotton or wool fiber, as these are prone to do when used in concentrated solution. Further, it makes a most excellent vehicle in connection with oxychloride of zinc, chloro-percha, or paraffin as a permanent and unalterable root-filling material.—EDWARD C. KIRK, in *Cosmos*.

ARTICLE VII.

A STUDY OF THE DISEASES OF THE PERIDENTAL MEMBRANE, HAVING THEIR ORIGIN AT OR NEAR THE GINGIVAL MARGIN.

BY H. A. KELLEY, D. M. D., PORTLAND, ME.

Read before the Maine Dental Society.

The condition I am about to consider to-night is most familiarly known to you, no doubt, as that of Riggs' disease; but it behooves us to use professional language and methods. It is the aim of science to obtain as perfect a nomenclature as possible, and it is not proper to name a disease after its demonstrator, however much we may wish to honor him. But I do not think any one name can designate the conditions. There are many under this one head seemingly the same and yet very different; having variable symptoms and exciting causes. It seems to me much of the difference of belief in earlier times, and even to-day, in regard to this disease, was and is due to this fact. These have not yet been classified, but are regarded as one pathological condition. Nothing but confusion can result from this, and it is not strange to find many theories in regard to it, and especially as to its origin.

It is the purpose of this paper to give certain conclusions of mine, in hopes that I may contribute something that may aid us to a clearer understanding of a disease so destructive in its results and yet so little understood. Salivary calculus, I think all will agree, is not the cause of serious disease. It is deposited at or near the salivary ducts at the gingival margin, or just above it, towards the cutting edge of the tooth. The theory of this precipi-

tation is as follows: The saliva contains both calcium phosphate and calcium carbonate, and these are held in solution by carbonic acid before the saliva is poured into the mouth. As the saliva enters the mouth this carbonic acid escapes and the lime salts are precipitated. This may be shown experimentally by a bottle with these salts in carbonic acid solution; allow acid to escape and salts will be precipitated. As the calculus pushes the gum down new deposits form, and as a result the gum may lose its tone and thus a more or less serious state of affairs result. But I think there is no attempt of this kind of calculus to work in under the gum margin, and only by the greatest neglect can it do serious harm.

It is easily scaled away, and when so removed we find the gum underneath it in practically a healthy state,—only a more or less loss of tone being seen, as there has been more or less neglect. The gum soon returns to its normal condition after its removal.

The results, possibly caused by serumic or sanguinary calculus, must be considered. First, we do not know that this species of calculus comes from the serum, or even from the blood. It is only a belief based upon certain analyses. "There is no evidence that it is derived from the blood. It may possibly be deposited from the pus bathing the tooth, and more probably from the saliva." (Truman.)

It certainly is different from ordinary tartar, and much more destructive in its results. Salivary calculus is a semi-solid mass, composed chiefly of water, calcium phosphate, and calcium carbonate, with a trace of calcic fluoride and magnesium phosphate. It is easily scaled away, as it does not seem to firmly adhere to the tooth as does the serumic. The latter, on the contrary, is a very hard substance, and removed only with great difficulty. It has not been analyzed, and I cannot correctly give you its constituents. What relation does this calculus bear to the disease?

In one of the latest papers on this subject, Dr. Allan

says: "To me it always seems that much of the trouble that many dentists meet . . . arises from a total misconception of its origin and cause. . . . I desire to state positively my belief that pyorrhœa alveolaris is always preceded by a deposit of serumal tartar." This statement he enforces later by saying: "If I had said, as a rule, the so-called pyorrhœa alveolaris had its origin in a purely local cause, or causes, and that nine out of ten times this local cause was tartar in some of its protean forms, I would have rightly stated my opinion. I go further, and say the constitutional diathesis theory begs the question and cannot stand close examination. All that can be said for a systemic origin is, the inflamed gingival or mucous membrane is prone to secrete lime salts, and these salts, in turn, become added causes of irritation." Dr. Allan believes the healthy mucous glands do not secrete tartar, and he regards a natural or acquired roughness of the neck of the tooth as the exciting cause of the unhealthy action of the glands that induces them to secrete the tartar. Dr. Allan says, while strongly of the opinion that this is correct, he is not sure of his position.

These are strong words and fill us full of hope that Dr. Allan has at last settled something. But this hope is quite dispelled, and we find ourselves again in doubt when, in the discussion of this paper, we hear the following from Dr. Truman: "Now, what is the origin of this pathological condition? Does it originate from tartar? Not if I understand it. Does it originate from the roughness of the gingival border of the teeth that Dr. Allan mentioned? When you find a bright red line at the border-line of the gum, there is the beginning. It has nothing to do with tartar. It may come from constitutional disturbances; it may originate from some form of nephritis, or a long siege of sickness. Immediately succeeding we have a development of micro-organic life. This disease has its origin in inflammation of the periosteum or pericementum of the roots of the teeth. There is no question about that. It

naturally follows, if we are to treat the teeth properly, we must direct our attention to the micro-organic life first, and not to the tartar, which is secondary. Where tartar is, in my judgment, there cannot arise—does not arise—this pathological condition.” Dr. Sudduth agrees that tartar is secondary to the disease, but says: “The initial phase we do not know. No man has ever been able to tell the cause of the disease; there is a catarrhal process, but what causes that to be set up has not as yet been solved. The deposits on the roots are a result of this catarrhal process. First, there is irritation, then follow micro-organisms, and these, in turn, become a source of irritation; but their direct connection with the disease has not been determined.”

Many of us think the very worst cases we have ever seen were entirely devoid of tartar, either serumal or any other kind. Now, it seems to me, in this disease, accompanied by deposits of tartar, we have what I consider one of two conditions that are described by various authors by the same name; and it also seems that whatever may be the predisposing cause, the exciting cause is the so-called serumal tartar.

In support of this statement I fear I can but repeat the old reasons for and against the local causation of the disease, but hope to be able to present them in a way that will convince you of their truth. It is my belief, as stated by Dr. Allan, that those persons that support the systemic theory only beg the question. It is so satisfying to throw the disease back on to the system. But what reason have we for so doing? We have a pathological state here always accompanied by calculus, which may be cured by the simple removal of the calculus, nothing else being necessary. The only way it can be treated is by the complete removal of this, and by so much as you thoroughly accomplish that will you succeed. Could anything point more clearly to the cause of the disease? Systemic conditions are but side issues; important, but not the origin. In support of this statement I need to present but the one

fact, a complete removal of the calculus will effect a cure. Not one case is on record of failure where this was thoroughly done. If the system were at fault, there would be exceptions to this rule. Dr. W. D. Miller says: "My view is, three factors must be taken into consideration in each case of pyorrhœa alveolaris—first, predisposition; that I mentioned as indicative of the disease are forming.

This destructive process proceeds in the direction of the fibres of the membrane—that is, towards the apex of the root. It may affect but one side of the root, and there may be pockets with healthy membrane between; but usually the affected tract widens and destroys the entire root membrane. Although it seems to be an infectious disease, the fact is not fully established. There is little or no recession of the gum, and the condition may be overlooked except a very careful examination be made. As a result of the loss of the membrane, the alveolar process second, local irritation; third, fungi."

I now pass to the last form of the conditions we are studying, the condition called phagedenic pericementitis. Many have adopted this name to designate all the lesions we have been considering. I prefer to use it as descriptive of this one condition. This, then, as the term implies, is an inflammation of the pericementum, resulting in rapid ulceration. The gums are but slightly affected. Thin flat instruments can be passed further up the root than is possible in a normal condition. The destruction of the tissues of the periodental membrane has begun, and the pockets disappears.

I have thus briefly described the simplest form of phagedenic pericementitis, but by far the greater number of cases are complications of this disease and due to calcic inflammation.

I have said of this form I believed the exciting cause to be calculus, but as the disease may certainly begin and run its course without any deposition of calculus, we must turn elsewhere for the origin. And it seems highly pro-

bable it is due to fungi or some form of micro-organism, and, as I have said, is, or seems to be, infectious. Dr. Black thought, at one time, he had isolated the fungus; but further investigation did not confirm his hopes. Miller has not been able to demonstrate the special organism producing it.

The treatment will be more in the line of suggestive hints than an attempt to describe any special mode. When the pathology is understood the treatment becomes easy. Until this is accomplished our treatment must be ineffectual. Where we are not sure of our foe it is hard to choose our weapons of offense and defense.

The conditions due to calculus are simple, and demand for their cure the exercise of surgical means and methods. Remove the calculus and all diseased alveolus (this must be thoroughly done by giving several sittings); establish drainage; accomplish depletion and give the affected teeth rest, and there you have the means of a cure. In proportion to the thoroughness with which this line of treatment is carried out will be your success. No medication is necessary if this treatment be thorough. But it is well to give the system tonics and use stimulants and antiseptics locally.

In the condition called phagedenic pericementitis the first thing is to remove any deposits that may be present as complications. After this is thoroughly accomplished it is absolutely necessary to resort to medicinal treatment. There is in well-developed cases no chance of nature effecting a cure, even with the calculus entirely removed, for the exciting cause still remains. The pericementum is being disintegrated and the alveolar wall absorbed. We must remove the diseased parts with instruments. Dr. Black would not injure the gum margin, but drainage must be secured, and this must be obtained at whatever cost. Then the lacerated pockets should be washed out to remove the debris and blood-clots. For this use a solution of mercuric chloride in peroxide of hydrogen, one grain

to the ounce. If there is great congestion of the gum, apply a thirty per cent. solution of chloride of zinc deep down into the pockets. Then proceed with Dr. Black's one-two-three solution :

Oil of cinnamon, 1;
Carbolic acid, cryst., 2;
Oil of gaultheria, 8.

Inject this into the pockets, once in four days, full strength, and supply the patient with the same solution diluted to one-half its strength with oil of lemon or oil of anise,—I prefer the former,—to be used as a mouth-wash. The patient must be watched carefully, and great care must be taken to prevent a return of the irritation of the gum margin, and cleanliness must be insisted upon, with examinations continued indefinitely, for I do not believe a cure could be absolutely promised with unfavorable conditions likely to occur.—*International Dental Journal*.

ARTICLE VIII.

THE COLOR QUESTION IN A DENTAL COLLEGE.

The Faculty of the Dental College of Denver University has decided to resign in a body if U. S. G. Cooper is reinstated as a student of the college by the Board of Trustees, and yesterday notified Chancellor McDowell of its determination. The members of the Faculty are George J. Hartung, Dean of the college; J. M. Norman, W. E. Griswold, A. H. Sawins, Charles F. Dodge, G. A. Dille, J. S. Donaldson, A. C. Watson and J. R. Donaldson, and they all signed their names to a statement of their position, which was sent to the Chancellor yesterday afternoon.

The Faculty met yesterday to consider the case, and was unanimous in its conclusions. The status of the matter from its point of view is summarized as follows :

U. S. G. Cooper applied for admission on November 5th. He was told that the time for entering expired October 10th;

that if he entered it could be but for a partial course, and that three full courses would have to be taken to entitle him to a graduating examination. Cooper was satisfied and entered for the infirmary course only. A reduction was made in the fee and he was given a matriculation card on payment of fifty dollars.

Three or four days afterwards complaints of his presence were made to the Dean, which culminated in written protests, signed by all the dental class except one, against the reception of colored students, but not including in the objection Miss Martha Jordan, a young colored woman who is a member of the class.

The demonstrators reported that several of the lady patients had objected to having Cooper hanging over them and working at their mouths while they were reclining in a dentist's chair, and said they would come no more if he remained. Three students gave notice that they would not attend the school next year if Cooper was there.

The Faculty met on November 12th, and, after full consideration, decided that Cooper's presence was an injury to the college. Dean Hartung had a quiet talk with him and laid the matter frankly before him. Cooper agreed to leave the college, his money was returned and he gave a receipt for it, expressly agreeing that he resigned all claims on the college.

The next the Faculty heard of the case was a letter from Chancellor McDowell, saying that the committee of investigation appointed by the Trustees, which consisted of Governor John Evans and the Chancellor, had decided that Cooper was entitled to reinstatement. The Dean wrote to the Chancellor that the Faculty considered it was entitled to a hearing before any decision was reached. To this the Chancellor replied on Monday to the effect that, Cooper being reinstated, the Trustees would hear the case of the Faculty.

Right here is where the Faculty registers its kick. It claims that if it has the right to admit students, it must have the same right to remove objectionable persons, if the interest of the institution demands it, the students, of course, having the right of appeal, as in this case. The Faculty sets up:

First: Cooper was admitted freely and frankly without regard to color.

Second: He was entered for only a partial infirmary course.

Third: He was requested to withdraw only after consideration.

Fourth: The Trustees should hear both Cooper and the Faculty before deciding.

Fifth: One side of the case only having been heard, the Faculty cannot consider Cooper as reinstated.

The letter to the Chancellor concludes that the members of the Faculty have been with the college for some time, some since its organization; that they have given their time and labor for a small compensation; that in all their actions they have had the interest of the college at heart, and that if they are now required to do that which in their judgment will be injurious to the college, while they will regret the severance of existing pleasant relations, they beg to tender their resignation at once.

Dean Hartung wrote to J. D. Patterson, of Kansas City, President of the National Association of Dental Faculties, which includes twenty-nine of the principal institutions of the country. Dr. Patterson, in reply, wrote that the Association had never considered the question of the admission of colored students, simply with regard to their color, and probably never would do so. He concludes: "So long as there is a college specially for them (Meharry College), I would send them there, and would not receive them into our class on account of expediency."—*Rocky Mountain News*, Nov. 23, 1892, and *Western Dental Journal*.

Communicated.

WORLD'S COLUMBIAN COMMISSION—EXECUTIVE COMMITTEE ON AWARDS.—Upon January 14 last the rules and regulations to govern the matter of awards at the World's Exposition were adopted. These rules provide among other things that each exhibit shall be examined by an individual judge, who must be so far as possible a competent expert and must formulate his opinion of an exhibit in writing and sign

his name thereto, and that this report must receive the confirmation of the Department Committee of which he is a member. There are thirteen of these Department Committees, one of which is assigned to each of the thirteen great Departments of the Exposition, and these thirteen committees compose the Board of Judges. There will be foreign representatives upon each of these thirteen committees, and also one or more women judges upon all committees authorized to award prizes for exhibits which may be produced in whole or in part by female labor.

It is the desire of the World's Columbian Commission to compensate judges, but this will depend upon the action of Congress, to which application has been made for an appropriation sufficient to defray all expenses connected with this subject of Awards. Should the appropriation be made, judges from the United States will receive \$600 each, and those from foreign countries \$1,000 each. Their work should begin June 1 and last about two months.

The management of this whole matter is in the hands of this Executive Committee on Awards, which is receiving applications for appointments as judges at their temporary offices and addresses as above. After March 15 the office will be permanently established in the Administration Building of the World's Columbian Commission, at Jackson Park, Chicago. As the judges are to be so far as possible competent experts, and the duties of the position require efficiency and ability of a very high order, and it is the desire of the Executive Committee to appoint only those absolutely qualified for the place and, whenever possible, of national and international reputation, this Executive Committee considers it its duty to call the attention of the technical journals of the country to the facts in order that it may receive the assistance and co-operation of those who by their position and connections are best able to assist the committee. It is not possible to make this announcement in the way of an advertisement, and the information is sent you in the belief that it is of sufficient interest to your readers to obtain some form of mention in your journal, and that you will suggest the names of such experts as you know to be of the capacity required.

JOHN BOYD THACHER,

Chairman Executive Committee on Awards.

THE FIRST PAN-AMERICAN MEDICAL CONGRESS.

SECTION ANNOUNCEMENT OF THE FIRST PAN-AMERICAN
MEDICAL CONGRESS, TO BE HELD AT WASHINGTON,
D. C., SEPTEMBER 5, 6, 7 AND 8, A. D. 1893.

President: William Pepper, M. D., LL. D., 1811 Spruce Street, Philadelphia, Pa.; Secretary General: Charles A. L. Reed, M. D., 311 Elm St., Cincinnati, O.; Treasurer: A. M. Owen, M. D., 507 Upper Front St., Evansville, Ind.; Chairman of Executive Committee: Dr. Henry D. Holton, Brattleboro, Vt.

Committee of Arrangements: (Office, Arlington Hotel, Washington, D. C.) Sam'l. S. Adams, M. D., Chairman, 1632 K St., Washington, D. C.; J. R. Wellington, M. D., Secretary, 1416 Fifteenth St., Washington, D. C.

Cincinnati, O., January 31, 1893.

To the Dental Profession of the Western Continent:

The Pan-American Medical Congress to meet in Washington, D. C., September 5 to 8, 1893, being an assured success, the Dental Section promises to be well represented.

No other section of the Congress can claim a greater number of men of scientific attainment. In artistic and mechanical skill, in accurate and delicate manipulation where surgery is involved, in Bacteriology and Histology and rapid progress in its speciality, no other surpasses that of the Dental profession. Able papers of the following subjects will attest the above assertion. Cleft Palate, Hare Lip, Orthodontia, Dental Anatomy, Histology and Pathology; new growths of every character pertaining to the mouth and teeth. Diseases of the maxillary sinus and alveolar processes, Periostitis, Pulpitis and their results, Operative Dentistry, Bacteriology, Mechanical Dentistry, in addition to many other suitable topics.

This Congress, being an out-growth of the American Medical Association, the requirements for membership in this section are identical with that of the A. M. A., viz.; Any reputable practitioner holding the title of D. D. S. or M. D. S. can become a member the same as if he possessed the M. D.

To members of the profession in our sister countries we extend a hearty invitation to visit us and participate in the meeting, either by writing papers or by being present to hear or discuss them. This is especially desirable since the Congress belongs equally to all American countries. Many of you will, no doubt, visit the great World's Fair. This is also the year for the World's Columbian Dental Congress in Chicago. This meeting, however, in no way interferes with the P. A. M. C., since the Columbian comes August 14 to 19 inclusive and the P. A. M. C., September 5 to 8 inclusive in Washington, thus offering two attractions in the way of Scientific Dentistry in addition to the Great Fair. Many of the officers of one Congress are officially connected with the other.

To the Columbian you are an invited guest, at the Pan-American you are participating in an institution as much your own as ours.

To the Dental profession in the United States we would suggest that in taking part in this, the first meeting of the P. A. M. C., we are the hosts, and our duties as such need not be rehearsed.

The excess of Dental practitioners in the United States over our sister countries will necessitate a careful selection of topics and papers in order to present the highest standard, the object being not numbers, but quality of material and ample time for discussion.

The social feature of the Congress will be no small part of the attractions.

Respectfully,

M. H. FLETCHER,

Executive President of the Section on Oral and Dental Surgery of the P. A. M. C.

EXTRACTS FROM REGULATIONS AND BY-LAWS.

MEMBERSHIP.

Members of the Congress shall consist of such members of the medical profession of the Western Hemisphere, including the West Indies and Hawaii, as shall comply with the special regulations regarding registration, or who shall render service to the Congress in the capacity of Foreign Officers. [*General Regulation 2.*]

CONSTITUENT COUNTRIES.

The following shall be considered as the constituent countries of the Pan-American Congress.

Argentine Republic, Bolivia, Brazil, British North America, British West Indies, (including B. Honduras), Chile, Dominican Republic, Honduras (Sp.), Mexico, Nicaragua, Paraguay, Peru, Salvador, Republic of Columbia, Republic of Costa Rica, Ecuador, Guatemala, Haiti, Kingdom of Hawaii, Spanish West Indies, United States, Uruguay, Venezuela, Danish, Dutch and French West Indies. [*General Regulation 7.*]

SECTIONS.

The Sections of the Congress shall be as follows:

(1) General Medicine, (2) General Surgery, (3) Military Medicine and Surgery, (4) Obstetrics, (5) Gynæcology and Abdominal Surgery, (6) Therapeutics, (7) Anatomy, (8) Physiology, (9) Diseases of Children, (10) Pathology, (11) Ophthalmology, (12) Laryngology and Rhinology, (13) Otology, (14) Dermatology and Syphilography, (15) General Hygiene and Demography, (16) Marine Hygiene and Quarantine, (17) Orthopædic Surgery, (18) Diseases of the Mind and Nervous System, (19) Oral and Dental Surgery, (20) Medical Pedagogics, (21) Medical Jurisprudence, (22) Railway Surgery. [*General Regulation 8.*]

LANGUAGES.

The languages of the Congress shall be Spanish, French, Portuguese and English. [*General Regulation 9.*]

REGISTRATION.

The Registration fee shall be \$10.00 for each member

residing in the United States, but no fee shall be charged to foreign members. Each registered member shall receive a card of membership and be furnished a set of the transactions. [*Special Regulation 2.*]

ABSTRACTS, PAPERS AND DISCUSSIONS.

Contributors are required to forward abstracts of their papers, not to exceed six hundred words each, to be in the hands of the Secretary-General not later than the tenth of July, 1893. These abstracts shall be translated into English, French, Spanish and Portuguese, and shall be published in advance of the meeting for the convenience of the Congress, and no paper shall be placed upon the program which has not been thus presented by abstract. Abstracts will be translated by the Literary Bureau of the Congress at the request of contributors, and should be forwarded through the Secretaries of Sections. Papers to be presented to Sections must not consume more than twenty minutes each in reading, and when of greater length must be read by abstract not exceeding twenty minutes in length. Papers read by abstract may be printed in full in the transactions, subject to approval by the Editorial Committee. Papers and discussions will be printed in the language in which they may be presented. All papers read in the Sections shall be surrendered to the Secretaries of the Sections; all addresses read in the General Session shall be surrendered to the Secretary-General as soon as read; and all discussions shall be at once reduced to writing by the participants. [*Special Regulation 3.*]

LITERARY BUREAU.

The Secretary-General may at his discretion organize a Literary Bureau, which shall consist of such number of linguists as he may determine, whose duty it shall be to do all necessary translating for the Congress, compensation for which service shall be determined by the Executive Committee. Certain members of the Literary Bureau may be designated by the Secretary-General as an Editorial Committee. It shall be the duty of the Editorial Com-

mittee to determine the eligibility of all contributions before the same shall be published in the Transactions, and to supervise the publication of both the Book of Abstracts and the transactions. All work done by the Editorial Committee and by the Literary Bureau shall be subject to approval by the Secretary-General. [*By law V.*]

Editorial, Etc.

THE AMERICAN MEDICAL CONGRESS.--Especial attention is invited to the section announcement of the first Pan-American Medical Congress to be held in Washington, D. C., next September. This Congress is an outgrowth of the American Medical Association, in which the Section of Oral and Dental Surgery was organized about twelve years ago. "Any reputable practitioner holding the title of D. D. S., or M. D. S., can become a member the same as if he possessed the M. D."

The papers discussed at the meetings of the Section of Oral and Dental Surgery of the American Medical Association, as is well known to readers of dental literature, have commanded the attention and respect of the medical profession. It is, therefore, fair to anticipate a profitable meeting in September, inasmuch as some of the officers of the Dental Section of the proposed Pan-American Congress are leaders of thought in the dental profession in this country, and have been active workers in and contributors to the Section of Oral and Dental Surgery of the American Medical Association in which they are recognized as men of unusual scientific ability.

R. G.

USES OF ELECTRICITY.—America has become the great centre of the production of electric light and power. A backward glance over a few years shows how young all the work is. The advantage of incandescent lighting need hardly be

enlarged upon to-day. The field of electric traction is great; the field of electric mining is even more extensive. The extent to which the idea of electric power in factories has won the day is shown in the numerous shops now operating in this way. In trolley cars the electric heater is becoming well nigh as common an object as incandescent lamps. The application of electricity in dental practice, adapted to the dental engine, the electric mallet, the mouth lamp, is well known to readers of this journal.

But "electricity up to date" would not be complete without reference to modern electro-therapeutics. It was the privilege of the writer recently to enjoy an "electric steam bath," given by Dr. Geo. W. Barkman, Hamilton Terrace, Baltimore. Dr. Barkman's electric treatment has been practically tested by gentlemen well and favorably known in Baltimore. The benefits to be gained from the use of electricity when applied by experienced hands in properly selected cases, and in nearly all forms of nervous diseases, are just becoming known. The cases that may be treated (but not by electricity exclusively) cover a wide range, including all kinds of neuralgias, facial and intercostal; gastralgia, cardialgia, sciatica, lumbago, etc.; hemicrania and all varieties of headache; the various paralyses in all possible situations; general nervous affections, both functional and inorganic, such as hysteria, hypochondria, paralysis agitans, progressive muscular atrophy, locomotor ataxia. In this connection it is well to emphasize its use in cases of facial neuralgia which come under the notice of dentists, as its application has met with gratifying results.

Dr. Hammond is quoted as saying: "Many of our physicians know almost nothing of this great agent." Would it not, therefore, it may be suggested in conclusion, be becoming in the family physician who has never been taught its use, who has no proper apparatus and would not know how to use it if he had, to place suitable cases in skillful hands? There can be no doubt that Dr. Barkman understands the working principles of the batteries he uses; in fact, he is an expert electrician able to construct and repair them. R. G.

SHOULD PREACHERS PAY.—The writer received from a well known specialist a letter worded as follows: "Dear Doctor, this will introduce the Rev. ——. He is under my care for — and asked me to recommend a good dentist and I have taken the liberty of sending him to you. Mr. — will not be able to pay you a fee but will no doubt be able to send you some patients. Yours very truly, —."

It is the opinion of many dentists and physicians that the custom of not charging any fee for professional services rendered to a minister of the Gospel or his family does its greatest harm to the clergy, and that it is with them that the reform ought to originate. Under the existing custom if a preacher and his family are being attended by a doctor in whom they lose confidence, it must be very awkward to demand that the doctor cease his gratuitous visits. It is not every one who is blessed with a person, like the maid described, who gave the doctor a hint. A lady had been ill and under medical treatment for a long time. As she grew no better all the while, she became distrustful of her physician's skill and did not wish to see him, and yet was not bold enough to tell him so. She communicated her state of mind to her maid.

"Lave' 'im to me, mum, lave' 'im to me!" said the girl.

By-an by the doctor came to the door, and Bridget opened it about an inch.

"Sorry, sir," said she, but ye can't come in to-day, doctor!"

"Can't come in? How's that?"

"The misthress do be too ill for to see ye the day, sir."

We do not believe that professional services can never be conscientiously dispensed except on a commercial basis, otherwise medicine or dentistry is only a trade, after all, and its dignity is gone. The custom should be abolished in the interest of both the clergyman and the doctor, among other reasons, because the clergyman is put at a disadvantage since he cannot always have his choice of attendance but must take his physician or dentist out of his congregation, if ~~his~~ to be found there. Moreover since he makes no payment in money, he must feel a delicacy in calling for service to the

tent which he would desire. Personally the writer has paid his family physician his fees, free of deductions, and has collected from him regular minimum office charges for dental services. On the other hand he has never sent any bill for services rendered the "pastor" but has charged members of the family. It is not known that any rule prevails among dentists.

R. G.

Monthly Summary.

GOLD ATTACHMENTS IN CASES OF CLOSE BITE.—By W. A. Robertson, L. D. S., Crookston, Minn.—It frequently happens that we are called upon to replace one or more teeth by means of a plate, in which the bite is so close that it is not possible to use rubber as an attachment. So in cases when the patient can afford an all-gold plate, we are in the habit of attaching the teeth by an extension of gold plate into the rubber. Although this is nothing new, we have met several professional friends to whom it was new, and as it has been exceedingly useful to ourselves, as well as many others, we trust a short description of the process may not be amiss, and may be of use to others.

Having obtained a correct impression and bite, we select a plate tooth to correspond with the natural ones remaining, and grind it to fit closely to the gum. When this has been done, attach the tooth by a little wax to hold it in position, and varnish and oil the labial portion of the cast around the tooth, and run a little soft plaster over it, sufficiently to just cover the cutting edge, by using a little sulphate of potash. This only takes a minute or two, and is of great convenience in attaching the backing, etc. When hard remove the wax and investment, and back up the tooth in the ordinary way. We have found the use of a little fine cardboard (that in which the manufacturers send out the solder is generally handy) very convenient in shaping the backing. Press the pins through the cardboard and trim with a pair of scissors to the size the packing is to be.

be, and by using this as a pattern, it is easy to cut the packing and punch the holes. When this is done, place the tooth back in the investment, and set back on the cast to see that the backing does not interfere with its going to place. If it is all right, cut a strip of gold plate (No. 30 is strong enough) about the same width for single teeth as the backing, and about one-half inch in length. Punch a few holes in this and bind to conform approximately to the roof of the mouth on the cast; lay it in place and close the bite to be sure it is right. Fasten to the backing with a little sticky wax, and remove from cast and invest in plaster and sand, equal parts, and solder. If the work has been carefully done, the soldered piece will go right to place, and the waxing up may be proceeded with. It is well to finish up the solder, etc., before waxing, as it is more troublesome to do when the plate is completed. When there are two or more teeth, we generally use the gold extension a little wider than for single teeth, attaching it midway between the two. This will be strong enough and saves time. In packing the rubber, draw out a small piece and then work it carefully under the gold extension, so as to insure it perfect imbedding in the rubber.—*Dominion Dental Journal*.

WATER AN ANÆSTHETIC.—The anæsthetic effects of cold water is much discussed at the Austrian capital. Dr. K. L. Schleich has discovered that absolute local immunity from pain, even during protracted operations, can be obtained without resorting to general narcosis of the patient, so that a sufferer may remain perfectly conscious during the amputation of his hand or foot without undergoing the tortures so often inflicted on the battle-field or exposing himself to the danger of syncope, ever present in the operating-room. It appears that subcutaneous injections of a solution of sugar or salt, nay, even of simple cold distilled water, will produce exactly the same local anæsthetic effects as cocaine. This discovery has already borne the test of numerous experiments,

and will now be tried in Vienna. The explanation of the phenomenon is simple.: Local insensibility to pain is caused in the case of cocaine by purely chemical changes, while cold water acts mechanically by means of high pressure and low temperature. Under the influence of the high pressure and sudden lowering of temperature the blood and lymph are driven from the region operated upon to places where the pressure is less. The tissue is thus deprived of its supply of blood and temporary paralysis of the nerves results. One of the first medical authorities affirms that the importance of this discovery is all the more undoubted, seeing that if, in a given case, cold water alone should fail to produce the needful degree of insensibility, a weak and absolutely harmless solution of cocaine would prove certainly efficacious.

X DEATH FROM ALVEOLAR ABSCESS.—Although fortunately of a rare occurrence, it is well to bear in mind the possibility of a fatal issue in cases of alveolar abscess. From time to time instances are recorded where pyæmia is caused by absorption of septic material from the socket, and the treatment adopted by Mr. W. A. Lane, in a case reported in the *Lancet*, is worthy of notice. A child of four years had an abscess in connection with a second temporary molar, which was removed, and the cavity was thoroughly cleaned out under an anæsthetic. The abscess had previously opened into the mouth, but there was much diffused swelling over the left half of the lower jaw. The boy became jaundiced and suffered from recurring rigors for four days. It was then decided to make an attempt to stay the progress of the condition by excising any thrombosed veins and clearing out inflamed tissues. The external jugular vein, which contained purulent material, and the facial vein, with their thrombosed branches, and many inflamed lymphatic glands, were removed. The patient was better the next day, but ultimately died, and at the post-mortem examination, a number of abscesses were found in the lungs and liver, produced before the operation.
—*British Journal of Dental Science.*

ROOT CANAL CLEANSER.—We have received from Messrs. West and Schwarz, of Vienna, a preparation for removing the decayed matter in the root canals of teeth. It is introduced by Dr. Emil Schreier, who states that it is composed of potassium and sodium, and that it acts upon the decayed matter in a root by decomposing it. It produces a high temperature during the process, and effervesces, transforming the contents of the root canal into a soapy mass, which is easily removed, at the same time it renders the canal proof against the cultivation of new germs. It is applied with a canal cleanser, and the operation is to be repeated until no further chemical action takes place. Dr. Schreier states that after this preparation has been applied to the canal it is immaterial whether any particles of matter remain, as they are rendered harmless. He cautions dentists against the too frequent use of the same cleanser, as the preparation acts upon the steel and is liable to make it brittle. Air decomposes the material, but the oxidation is confined to the surface only, he recommends that the cork shall be pushed down on to the preparation each time after using; the bottles are made without necks for the purpose.—*Dental Record*.

FIRST AND SECOND MOLARS.—My study of the comparative liability of the teeth to decay at the different periods of life, shows that the first molars are attacked in the first two or three years after eruption, much oftener than any other tooth. But in after years they are attacked less often than the second. If both the teeth are in a fair condition at the age of fifteen, the chances for the first are better than those of the second. Decay occurs on the surface of the second molar much oftener than in the same locality in the first, and is much more difficult to treat.—*Dr. G. V. Black*.

THE
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—OF—
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BALTIMORE, APRIL, 1893.

No. 12.

ARTICLE I.

CHAPIN A. HARRIS, M. D., D. D. S.

BY SAMUEL J. COCKERILLE, D. D. S., WASHINGTON, D. C.

Read before the Virginia State Dental Association, 1892.

With the profession of dentistry there has been no recognition—no proper recognition—of the great and invaluable services of the grandest name ever connected with dentistry. We have waited, hoping it would not fall to the lot of so humble a personage as myself to call attention to this fact. Mr. President, with your consent and that of your Society, we would like to offer a few words to show why this should be done.

The organs with which we have to deal give more pain, cause more suffering, and undermine more constitutions than all other causes put together; we do not except that arch-enemy of the human family—cold. It is our province to prevent this, and keep the economy in its normal condition. Our profession enables us to do this more successfully than any other. A profession is great, grand,

noble, and glorious, only in proportion as she can confer benefits upon the human family—a profession is of value *only* in proportion to the amount of good she can accomplish. The study of dentistry as a science does more to quicken the mind and elevate the soul than any other study. Dentistry is the greatest, grandest, noblest, and most glorious profession known to man. To whom are we most indebted for our profession? Dentistry was a dismembered and headless body cumbering the earth.

God made the opportunity, the genius of Chapin A. Harris conceived the idea of a Dental College; and with the aid of other noble spirits, the members were united into a body and a head erected on the body—the Baltimore College of Dental Surgery.

They breathed into it the breath of life and gave to us a profession. When it was our privilege and good fortune to be a student in those halls, the Faculty equaled that of any other institution of learning in this country. We had Cone, Bond, Handy, Pigott, Austen, and the father of our profession. Let no dentist forget that in the dark days of dentistry Chapin A. Harris was the lamp that let light into that darkness.

// Books are the real sources of all recorded learning. They chronicle the discoveries in science and perpetuate truth. When the truths they contain were expounded and the discoveries they commemorate were illustrated by these wise and gifted men, we truly felt that no more royal road to learning could be devised, and the young man who sighed for other channels of instruction might well despair of attaining excellence.

The time arrived when dentistry demanded an honorable place among her sister sciences, and the Baltimore Dental College sprang into existence as the natural fruit of Harris' earnest and protracted labors. Previous to this, the study to obtain knowledge of dentistry was mere groping in the dark. When all others practicing dentistry had secrets, his well of knowledge was free to all. To all who

were athirst he said, come. Whosoever will let him take of my knowledge freely. He was the first to teach that the attainment of excellence in all things connected with dentistry is not only a high moral and personal duty but is likewise an obligation imposed by the community whose bounty is enjoyed. That the obligations we owe to dentistry are the highest considerations which can influence our actions with reference to our duties on earth; and therefore we should engender and diligently cultivate a sentiment of professional pride. These sentiments are worthy of all commendation, and fit companions in the dentist's bosom for these holy influences which awaken there reverence for and devotion to his God.

Professional pride—Harris' bosom, mind, and soul overflowed with it—is an active desire to see our immediate profession respected, prosperous and happy. It has its origin in that tender feeling, which is the strongest instinct of our natures, incites us to nobler actions and induces greater sacrifices than any other impulse of man's bosom. This feeling is the same as that love and affection for parents, sisters, brothers, friends, that is usually found around the family hearth and which when cultivated, clusters eternally around the heart. No profession can flourish where this sentiment is not taught as a principle, cherished as a passion, and made subordinate only to religion, in the ardor with which it glows in the bosom of her sons. It is the efficiency of this sentiment which controls our actions, stimulates high resolves and secures the sacrifice of individual interest to professional good. The strength, beauty and prosperity of our profession, consists in concentrating our actions, thoughts and affections. A generous competition between individuals, in their effort for honorable distinction, is the greatest incentive to success; so does the rivalry among the members, in their contest for pre-eminence in ameliorating the condition of their patients, ensure to each greater progress in the march of improvement. It is the aggregate

of character and prosperity thus attained by the several members which imparts to the profession the glory and grandeur of its character. If a noble spirit of emulation existed and operated in our profession, to animate and direct us on, what limit could human prophecy affix to our professional advancement? Would to God that our beloved profession thrilled from center to circumference with the inspiration of this spirit. Would that we could this day kindle in every dentist's bosom the regenerating spark; for we are here to speak for Harris and dentistry; and if we speak plainly and boldly, it is because all that we are, all that we have, and all that the future has in store for us are hers, and from our perfect and full consciousness of devotion to her institutions and her interests. We impress it as a duty of paramount importance to cultivate the sentiment of professional pride.

This sentiment should be cherished with ardent love and it will imbue you with unfaltering devotion to our profession, her institutions and to one another. Such devotion, and such devotion only, will lead you in the right—to duty. Remember, the time will soon come when the youngest of you will have to say, our

Way of life is fallen into the sere,
The yellow leaf;

and the impulsive energies, which alone induce you to strive for the good and honor of the profession, and preserve the name of Chapin A. Harris from oblivion, will be nipped by the frosts of age before your affections and sympathies can attain the haven of professional pride, and onward and upward until full justice is done the father of our glorious profession. Honor his memory; keep it green in your hearts and hand it down to your children and your children's children to the remotest generation, making the profession a blessing to them. We expected the great State of New York to step forward and do justice to her noblest son; she failing, we turned with

anxious eye to his adopted State, the State that gave to the world its first Dental Collège, but we have waited in vain. She seems to have forgotten the great work of Harris in helping to make Baltimore, her great city, the center of medical education.

The profession turns her eye to Virginia to see the first move towards doing his memory justice. After the discovery of America, the best people landed on this continent settled in Virginia, and she has always led in all that is good. Her great son, Patrick Henry, was the first to conceive the idea of the great rebellion. She gave to the great rebellion its leader—the arch-rebel of the world—the immortal Washington. In all branches of learning, art and science, her sons have been the greatest. Time will never efface the fact that Stonewall Jackson, the greatest soldier and purest Christian, and most perfect man of history, and the noble old Roman of the nineteenth century, Robert E. Lee, were Virginians. Let Virginians always remember that the man who did most for the good and benefit of the human family and nothing to its injury, the gifted and world-renowned Maury, was a Virginian.

While claiming Harris as the morning star of dentistry, we do not forget the noble Virginians who labored successfully for dentistry, and to-day we point you to numbers of your society and State, especially the Nestor of Dentistry—the foremost man in Dentistry—your Thackston, as examples of virtue showing what you may become. In Thackston's wisdom we all delight. If those who do not know him would come to Virginia and question him they would return to their friends and say, behold, the one-half of the greatness of his wisdom was not told them; for Thackston's wisdom exceeds the fame they had heard.

After the most terrible war which was waged against the Southern States by the Northern and Western States, the Federal Government recruiting her armies from all quarters of the globe, endurance, courage and generalship

succumb to numbers. Virginia bore the brunt of battle, but from the ruin her queenly form rose, and is now the admiration of us all. It must be plain to all why we turn to Virginia asking that justice be done to the memory of our greatest dentist. All hearts by the impulse of an instinct, which is a surer guide than reason itself, turn to Virginia.

Considered simply as a dentist, Harris was a genius. He devoted his life to the earnest study of medical and scientific literature. It would be difficult to overestimate the value of the services which he rendered to the cause of higher education and instruction. Every lover of dentistry owes a distinct debt of gratitude to the man. Happy were those students who sat under his teachings and heard his wisdom; as that which we are we shall teach, not voluntarily, but involuntarily. The more thoroughly disciplined and fit a man may be for any really great work, the more conscious will he be of his own unfitness for it, the more distrustful of himself, the more anxious not to thrust himself forward. How different the zeal of the half-instructed.

His rule of conduct was to keep his mind unbiased by theories and speculations; never to have any wish that an investigation should result in favor of this view in preference to that; and never to attempt by premature speculation to anticipate the results of investigations, but always to trust to the investigations themselves. Satan, clothed in the light of an angel, has blinded the judgment of the profession; but Harris would never have been led astray. Dr Edward Maynard, and a few others; be it said to their credit, were never deceived and led into error by his glittering show. The touch-stone of truth should have an abiding home in the conscience of each and every dentist and be applied to all operations; and remember, ~~that~~ duty is the sublimest word in the English language. If meat maketh my brother to stumble, I will eat no flesh forevermore, that I make not my brother to stumble.

Harris understood that students are very apt to make

the conduct and attainments of their teachers a standard for their own standing. Without a watchful eye over our own hearts and heads, we are lead to regard unduly the opinions not of teachers only, but of the world; and this may prompt us to do what an untrammelled conscience would condemn. Therefore, we should abandon all vicious connections. We should not expect to keep entirely free from charlatans and the unprincipled. Circumstances over which we have not control may bring us in contact with persons whose habits and manners we cannot control. Treat them with all the kindness and politeness due from man to man, but do not make them your favorites and bosom friends. We must be determined not to allow such persons to influence our actions and judgment. Is the poor creature worthy to be called man who says he would willing, ay, gladly reform his ways, but that his associates will not permit him? We say to such, be a man; cast off such companions, and follow the dictates of your judgment. If any one allows his principles to be blasted and his conduct controlled and regulated by another to his own detriment, is he not a fool? and does he not forfeit our respect? Alas! how many have ruined their professional hopes by following the wishes and advice of friends whose character they knew would prove hurtful, as they were surely deficient. We know that a man in the wrong feels at times that he would gladly move himself from evil influences, but he does not attempt it. Are we afraid of the ridicule and scoffs of such friends, or is their company so sweet we cannot live without it? How deplorable the condition of him whose enjoyments depend so much upon another, that he cannot part with him at the call of professional pride and duty. Can any right thinking man be ready to barter the good of his profession for the company of him who is a detriment to that profession? Is there no satisfaction in breaking off from those who furnish us only bad examples, and seeking the society of the wise and the

good? The example of the wise and the good purifies and strengthens our judgment. In following the company of those who are striving to keep down dentistry, we prove ourselves to be slaves. We comply with our evil passions and call a license liberty. We are tempted to that which is wrong. We follow our low and corrupt propensities and passions and are led into bondage. We are told they are the silken bands of friendship. They may be silken, but they drag down our profession and lower our professional standing. A creature in this unfortunate situation is truly to be pitied.

Harris was a hard worker, and devoted all the resources of his cultivated mind to further the welfare of his profession. He realized the importance of study, education and drill, in the most important art of operating upon the teeth; that it is the duty of a good man to cultivate truth, purity and industry. With the students he was punctual, truthful, straightforward, industrious and always kind. In his family, he was forbearing and loving to his children; to his wife he was the perfection of purity and devotion.

Harris was undoubtedly the most prominent man ever in dentistry, around whom, as the glorious noonday sun, have revolved for half a century the lesser lights in comparative obscurity. Full well do we know it has been the effort of the less gifted to pull down by envious detraction his towering reputation. Thank God, it was built upon such a solid and perfect foundation that no earthly power can shake it. He was more than a dentist—he was a Christian gentleman. Strive to imitate his genius and emulate his virtues. Let not the names of our great and useful men pass into oblivion.

ARTICLE II.

POINTS IN EXTRACTION.

BY R. W. GILLETT.

Extracts from a paper read before the Students' Society, Dental Hospital of London.

Before commencing my paper I think a few introductory remarks would not be out of place, so that we can have a clear understanding as to the scope of the paper. The heading of my paper may be rather misleading to some of you, as it was decided upon before I had really given the subject my whole attention. I shall not attempt to describe to you the different methods of extracting the various teeth, as I believe that they may only be learned by constant practice in the extracting-room. I shall only make mention of a few general hints. With regard to the instruments, little can be said dogmatically, as every one will probably have a different opinion.

* * * * *

We next proceed to examine the mouth, looking for : exposed nerves, especially chronically inflamed pulps; diseased roots; especially chronic periostitis and exostosis; irritation of the nerve from a filling or nearly exposed pulp or pulp-stones; impacted teeth, especially wisdoms. The wisdom teeth are the most common cause of neuralgia, as their roots are situated close upon the trunks of the nerves, and are sometimes perforated by them. Exposed nerves are best found by introducing a small plug of cotton-wool on a pair of dressing forceps, which usually gives pain in the region referred to. Diseased roots may be found by tapping the teeth one by one, and by the presence of inflammation in the gums. For exostitis the teeth should be pressed from side to side. Irritation of the pulp may best be found by applying to each tooth a

piece of cotton-wool soaked in iced water. Impacted teeth are usually discovered from the absence of one of the teeth from the series, and signs of inflammation, especially swelling of the part.

THE EXTRACTION OF TEMPORARY TEETH.—With regard to the forceps, I think that the forceps we now use in the extracting-room for children's teeth are far from perfect. Why should we attempt to extract a child's temporary tooth with a pair of forceps which are meant for a fully grown man? Of course, temporary teeth can easily be extracted with almost any forceps, but are we extracting so as to give the least possible pain? I think children's forceps should be so small that they can be held in the operator's hand so as not to be seen by the child. Forceps should be made to fit as accurately as possible round the roots of the teeth to be extracted, with just sufficient room to clear the crown. I do not see why they should not be made after the same pattern as those for the permanent teeth, but they should be proportionately small. Temporary teeth as a rule, in a patient child, are not much trouble to extract, but when they have been retained in the jaws long after their time for removal, and their roots are unabsorbed, they will often cause some little trouble to extract, as their roots are very divergent and the alveolus has become very dense around them. Temporary teeth will often be found lying on the gum in a necrosed condition; their removal is then most easily accomplished by means of the elevator and forefinger. A pair of large dressing forceps with serrated blades are also very useful to remove such fragments. Care should be taken in the extraction of temporary teeth not to go up too far, as there is some danger of injuring the permanent successor. For various causes the extraction of a temporary tooth is often not at all advisable. We must, therefore, do something to relieve the pain. If it is caused by an exposed nerve, a dressing should be applied of two parts of creasote to one of mastic on a little cotton-wool; or a very good plan is

to place a tabloid of cocaine over the exposure, and keep it in place with some cotton-wool and mastic. This will generally relieve the patient from all further trouble, especially if instructions are given to keep the bowels well open.

THE EXTRACTION OF PERMANENT TEETH.—Before extraction is commenced a few precautions are necessary. The instruments should be thoroughly clean, and disinfected by dipping into a one-in-twenty solution of carbolic acid; or a good plan is to have a pot of boiling water always in readiness, into which the instruments should be dipped for a minute or two before using. This acts in two ways: (1) as a disinfectant, (2) and it warms the instruments ready for use. Warmth is exceedingly necessary for the comfort of the patient, as, if the instrument is thoroughly warmed, the patient will often scarcely feel the forceps going on to the root. On the other hand, if you apply a cold instrument to a sensitive periosteum, you will give the patient a shock and cause him to flinch, and so lessen your chances of extracting the tooth. After the extraction do not forget to press the walls of the socket together with your fingers, as by doing this you bring into position again any fragments of the alveolus which have been forced outwards in the extraction of the tooth, and which, if left, often give rise to inflammation and much pain by irritating the periosteum. Here I must add that we should not try to do too much at one sitting. Some patients will experience very much more pain than others, especially those who have suffered from rheumatic fever and nervous diseases. Then again, patients who are very good at the time will often suffer very severely afterwards from headache and exhaustion. Although we can scarcely lay down any rules for extracting, yet, perhaps, after all, there is something in the old rule of: "First grasp your tooth, then move it in its socket, and lastly take it out." To these fundamental laws I would like to add a few more. Always take the tooth in the direction of least resistance,

or, in other words, in the direction in which you feel the alveolus giving way. Lower wisdom teeth are generally best taken inwards, as they are supported externally by a strong ridge; viz., the external oblique line. Upper molars, on the other hand, will move in the outward direction most easily, as their long palatine fang acts as a buttress against inward movement, and the alveolus on the outer side is much thinner.

* * * * *

When the outer or inner surface of a molar tooth alone is standing, it will often be advisable to cut off the standing portion, in order to let the stump forceps go well on to the root. In extracting molar teeth with divergent roots, the dividing forceps are sometimes necessary. Having got the forceps well on, an attempt may be made to extract the tooth before crushing, as teeth will sometimes come out better with the dividing forceps than with the others. When the teeth are badly decayed, some operators use a spear-headed elevator, which they thrust in between the roots, and so loosen them for the stump forceps. Among the difficult teeth to extract may be mentioned those most delightfully lopsided molars described by Mr. Pearsall as oblique-rooted teeth, from which molar forceps invariably slip. They are, I think, best taken with a large pair of root forceps. Teeth with honeycombed crowns are also often very difficult to extract, owing to the immense length of their roots and the firmness with which they are implanted.

THE ELEVATOR.—The most useful forms are the straight oval shaped and the curved elevators, but some operators prefer the spear-headed form of straight elevator. The straight elevator is most useful in the extraction of the lower wisdom teeth when the molar in front is standing. For upper wisdoms it should not be used on account of the liability of fracturing the tuberosity and pterygoid process. It should be carefully guarded with the forefinger, when introduced into the mouth, and thrust deeply

into the socket, between the wisdom and the adjacent tooth. The elevator should then be turned on its long axis, so that its lower edge cuts into the root of the tooth and raises it from its socket. The handle may then be drawn slightly forward and downwards. The thumb or finger of the left hand should at the same time be placed at the back of the tooth to prevent it going down the throat. To rotate the elevator on its long axis a fairly large handle is necessary, as little leverage is obtained. Great care is needed in moving the handle of the elevator much in the forward direction, as is sometimes practiced, for then the leverage is so great that there is danger of fracturing the adjacent tooth, or even the jaw itself. The curved elevator is most useful in extracting the roots of a first or second lower molar, especially the posterior root when the anterior has been removed with forceps. The elevator should be thrust into the socket behind the posterior root, and then the root can be turned out into the empty socket, the natural curvature of the root being in a suitable direction for it. I cannot agree with the plan of putting the elevator into the empty socket and bringing away the septum with the root, as I think you require much more force, and the parts become so bruised that you often get trouble afterwards.

Much more could be said of the complications of extraction, but time will not permit me to say more now. I hope, however, they will form the subject of another paper, together with hemorrhage and pain after extraction, which I have purposely left out. In conclusion, I must thank you all for the kind attention you have given me this evening, and I hope the discussion may prove more interesting.—*London Dental Record.*

ARTICLE III.

ABSCESSSED TEETH.

Discussion in the New York Odontological Society.

Dr. J. N. Farrar uses non-escharotic creosote in the treatment of pulpless teeth that are not associated with abscesses—wood creosote in combination with alcohol. The object of the alcohol is to enable the creosote to act in the presence of aqueous moisture, if there should be any in the tooth.

J. N. Farrar says: The plan of drying teeth with hot air is excellent, but I think bibulous paper will extract about as much water as the heating process, unless this is kept up for a long time. I do not regard moisture in the dentine as injurious to the tooth, but the pulp canal should be dry. If there are no abscesses, I fill the canal at the first sitting, if I have time. If I do not, I close it tightly. The great trouble with many dentists is that they fill temporarily with cotton saturated with some kind of drug, and then do not seal tight the canal. It should be sealed with something that will prevent any kind of micro-organisms from entering. I use phosphate of zinc cement over the cotton. When permanently filling a pulp canal I generally plug the apex with gold. What is needed is a small wad of indestructible substance.

Nature is our best guide in the treatment of an abscess. She makes a fistulous drainage from the socket. Drilling through the gums and socket, to the interior of the trouble, is the only scientific plan of treatment. I derived so much benefit from this treatment that in 1878 I gave a course of lectures on it at two colleges.

The ragged bone is generally necrosed bone. After an abscess has found vent through the side of the socket, the sac changes in its character. It hardens, in a measure disappears, and if the alveolar process behind the sac is de-

prived of its nutrient supplies it dies, and the sac dies in consequence, leaving a chamber filled with liquid substance. I call these cases sepulchral abscesses. The proper treatment, of course, is to go in there, and cut all the dead part out; cut with a sharp bur till the healthy tissue is reached; sometimes, however, it is difficult, if not impossible, to get all the dead bone out. In such instances there may be a temporary relief. Even if there is left some carious bone, it may, after a time, die—become necrosed,

Sometimes the end of the root projecting into this cavernous place itself takes on a degenerative condition. In fact, often the ends of these roots are rotten. These formerly plagued me much. Once I had a case that was favorable to amputate the root, and I did so. Of course that left the opening into the pulp chamber enlarged, so that it had to be filled with gold wire to make it tight; but it cured the abscess, and since that time the amputation of roots has, with me, been a common practice.

Concerning creosote as a remedy, I look on it in this way: If a sore is on the outside, an ulcer, we would not use creosote, nor would we use creosote in a flesh abscess just under the surface; we might perhaps wash it with something mild, such as castle soap and water, but with bone abscesses we are dealing with something different. Iodine preparations are disagreeable because they discolor, but they otherwise do very well. I think it is proper to cauterize the interior of a sac. Of course, there is no such thing as a "pyogenic membrane," but there is a sluggish surface which should be removed. When this is destroyed, and the parts are treated with some simple liquid, such as salt and water, injected every day or two till that degenerated substance is all driven out, and the contents are prevented from becoming rancid by continuing injections of salt and water, Labarraque's solution, or wood creosote and alcohol (which is non-escharotic) once in five or seven days, it will, generally be followed by healthy granulations and a cure. For cauterization of a

sac I have found escharotic creosote (coal tar creosote), or sulphate of zinc, as effective as anything. Either pump it through the canal of the tooth till it appears at the mouth of the fistula, or inject it through the fistula with a syringe.

Dr. Darby, of Philadelphia: Creosote and carbolic acid have been used in dentistry from time immemorial. Especially is this true of creosote, and, though it is not absolutely essential in a dental practice, it certainly has served, and is still serving, a very good purpose in the treatment of devitalized teeth and chronic alveolar abscess. We all know that many a sac at the apex of a root has been broken up, and a fistula healed by the escharotic effect of good creosote. The same may be said of carbolic acid. There may be better remedies than either, still I am not yet prepared to abandon good English creosots made by Squares, of London.

Hot air for drying the canals of teeth, to be effective, must have pressure behind it to force it into the root of the tooth. Some years ago I put into my laboratory an apparatus for giving me compressed air. It consists of the following:

A cylinder, made of galvanized iron, holding a hundred gallons, with a pipe running to my office, and at its end a gauge to denote the number of pounds pressure. A stop-cock within reach of the chair and a rubber tubing reaching to the mouth of the patient, with a Taft hot-air syringe, and a little spring cut off, to be held in the hand. In the laboratory, in close proximity to the cylinder, is an air-pump, and each morning the man pumps into this cylinder compressed air, from five to thirty pounds. By simply holding the bulb of my Taft hot-air syringe in the flame of my small Benson burner, I can have any degree of heat desired, and sufficient pressure back of it to force it into the root of the tooth.

To me this apparatus has been almost invaluable, as I am enabled to dry a tooth more thoroughly than I have ever been able to do in any other way.

When opening a devitalized tooth, in which I suspect septic conditions, my practice is to put into the pulp chamber a few crystals of the permanganate of potassium, and then washing it with its solution, after which I dry it with the hot-air blast, then wash it with absolute alcohol, and dry it this time with as much heat as the patient will endure.

Cotton has been recommended as a root filling, and in Philadelphia there are some who must believe in it, for they certainly use it a great deal. I have often removed cotton from the roots of teeth years after it had been put there, and the roots seemed in a healthy condition, and the cotton was not decomposed.

Drilling through the end of the root for relief in acute abscess is not often attended with pleasing result. My own experience and observation teaches me that the practice is a bad one, and leads to difficulty when it becomes desirable to find the root. But I do not believe in cutting or drilling through the alveolar process. This may do very well for the six anterior teeth, or for teeth with a single root, where the length can be ascertained, but when the abscess is at the apex of a double- or triple-rooted tooth the operation is too uncertain.

The first step is the thorough removal of the entire pulp *debris*, without which it is impossible to fill the canal properly. The opening up of the canal is best done in most cases with the flexible engine drill. There are comparatively few roots which cannot be opened up by this means to the very end; in the few which cannot, a fine flexible probe of piano wire, lubricated with a drop or two of carbolic acid, can be passed, with a little force, nearly, if not quite, to the apical foramen. The only exceptions to the rule to open the canal its entire length are those where the root is extremely crooked, rendering perforation likely, and those in which calcification has taken place. In the young the root canals are much larger than in older persons, and there is, therefore, greater necessity

for opening the canal freely. Too many operators make the fatal mistake of not cutting away sufficient of the tooth to allow the drilling to be done on a line parallel to the direction of the root.

The next step is the perfect cleansing of the canal. Simply forcing the ground-up dentine out by means of an air or water syringe, and then swabbing with cotton pushed into the canal as far as the probe usually employed will carry it, will not answer. That is not perfect cleansing, and is far different from what I mean. Too few dentists, I am afraid, have the proper instruments for accomplishing what I wish understood by perfect cleanliness, which is a task requiring time and patience.

My method is, first, to prevent, as far as possible, the entrance of moisture into the canal during the drilling; then, having desiccated the powdered bone with a blast of hot, dry air, I work into the canal with a rotary movement a delicate, tapering probe, frequently withdrawing it to carry out the power adhering to its sides. This procedure is continued till the powder is completely removed. The hot blast is then again applied till the patient complains of discomfort from the heat, when Darby paper-points are used to ascertain if there is any moisture remaining at the extremity of the canal. Sometimes it will occur that serum or blood oozes from the vessels at the end of the root, and finds its way back into the canal, a fact which can be only ascertained by the measures just noted, unless the exudation is considerable. (When the apical foramen is large, or the root not fully developed, as in the teeth of young persons, it is difficult to check the extravasation of blood, requiring delicate surgical treatment to heal the wound before this filling of the canal should be attempted. When the filling is inserted, precaution must be taken against too much pressure on the freshly-healed surface, or the wound may reopen and complications follow.) With the tooth dried as far as the heat will penetrate, the remaining moisture in the canaliculi is absorbed,

and the canal is ready for filling, unless the pulp is putrescent, the treatment in which case will be stated further on.

For filling root canals I have tried cotton, gold, amalgam, and cement, and long since discarded them, because, in my judgment, it was not possible to do perfect work with them. Not one of those mentioned can be made to enter and fill the canaliculi, which is an important part of the operation, as lessening the possibilities of the decomposition of the animal matter of the dentine. Nor can any one of them, in my judgment, be perfectly adapted to the walls, with the possible exception of cases where the roots are straight and short, and can be freely reamed out. I therefore use chlora-percha.

My method of introducing the chlora-percha is to flood the canal with chloroform; and, placing the patient in a position which will assist in the expulsion of air from the tooth, work the chloroform with a delicate probe to the end of the root. The thorough diffusion of the chloroform is, I believe, greatly assisted by capillary attraction, owing to the extreme dryness of the tooth. This is immediately followed by the introduction of gutta-percha canal-points, which, by the aid of a to-and-fro motion, are dissolved in the chloroform along their entire length, forming the chlora-percha, which is distributed into every portion of the interior of the root accessible. Point after point is forced in, and placed in this manner, till the entire canal and the open canaliculi are filled with the chlora-percha.

I employ this method in all devitalized teeth, providing, of course, where the pulp is putrescent, for its deodorization and sterilization. This, however, is a simple task; hot water and hot air are usually sufficient, few, if any, medicaments being required. When pericemental inflammation exists, I prefer the tincture of iodine to any other dressing, though some of the derivatives of this drug, as iodoform, aristol, etc., will accomplish perhaps equally

good results by longer application. I see no necessity for the use of carbolic acid or creosote in the treatment of this condition, except to avoid a greater and more obnoxious odor.

I am opposed to treating alveolar abscess in any other way than by a positive and accurate procedure,—amputating the root, etc.

For years I relied on therapeutic measures, among them the injection of carbolic acid and creosote, though I employed the latter very rarely, partly because of its objectionable odor and partly because of my belief that carbolic acid was better. It was generally necessary to enlarge the apical foramen and force the medicine through, in the hope that its escharotic effect would destroy the sac and fistula, and thus the disease eventually disappear. Usually this method consumed much time, and only those that could well afford the luxury of such treatment received it. Great care is required in the use of carbolic acid lest it should accidentally come in contact with the gum. I have not infrequently observed much damage to the alveolus following its employment.

Early in my practice I realized the importance of positive surgical treatment in alveolar abscess, and for eight years I have employed that method almost exclusively, and, I am glad to say, with general success.

After the root has been cleansed and filled as before described, the next step is to complete the filling of the cavity in the tooth. This should be a permanent operation, as the tooth is never again to be opened. A local or general anæsthetic is now resorted to, as the patient or the case requires. If the fistula exists, the probe usually leads directly into the sac or the excavation in the alveolus, which is invariably present. If there is no fistula, or if it is at some distance from the seat of trouble, a direct opening into the sac must be made. For this purpose I prefer a spear-pointed drill which is thrust through the gum and alveolus in a direct line with the root. Prac-

tice and delicacy of touch shows where to drill and when to stop. A rose bar of suitable size is now inserted and rapidly revolved, to cut away the sac and necrosed bone. If the apex of the root is necrosed, it is likewise burred away, or if the necrosis is extensive, so much of the root is amputated as is necessary.

Amputation usually requires a larger opening through the wall of the alveolus, and in extreme cases a flap of the gum and alveolus is turned back to allow room for the saw and for the removal of the diseased tissue. Then cleanse the cavity and check the hemorrhage. Hot water injections will usually stop the bleeding, when an opportunity is afforded for ocular examination. Sterilize the wound, and if it is large, pack with antiseptic lint, continuing the dressing till no longer necessary. The antiseptic dressing may consist of injections of suitable solutions to aid in the healing of the parts.

If the operation has been inconsiderable, the wound may be left entirely alone after injecting with hot water and removing the *debris*, with the expectation of a cure. Even a fistula at some distance, necessitating a false opening into the sac, requires little treatment and soon disappears.

Generally the amputation can be accomplished at the time the root is filled, but to impress on you the importance of immediately curing all classes of abscesses with fistulous opening, it is only necessary to remind you that wherever found they are usually tubercular. If the antrum or nares is penetrated by a fistula, special treatment is commonly necessary.

I believe the root canal should never be left open, because so long as it remains open, resolution at the end of the root is practically impossible, owing to septic influence at the base of the newly-formed tissue, which again breaks down, unless the risk is provided against by immediate filling. To enlarge the apical foramen is complicating, by rendering more difficult the adaptation of a perfect filling,

besides endangering the integrity of the new tissue by the likelihood of the filling material being forced beyond the root apex.

The operation of alveolotomy, as this process is called, is to my mind, based on a rational view of health and disease. An abscess is nature's way of getting rid of a disturbing influence, and often considerable damage to the surrounding parts and great suffering to the patient are the outcome of her efforts to dislodge the intruder. The indication is, therefore, to assist nature by removing the affected tissue which cannot be restored to health and usefulness. My vote is, therefore, for surgical procedure in both acute and chronic alveolar abscess,—some differences in the care of the two forms are required,—because experience has taught me that it is the best and quickest method to assist nature to assert herself.

Dr. Crouse, of Chicago: These surgical dentists, these men who get surgery chronic in their minds, think that the only way of doing anything is by a surgical operation. If there is any place I would steer my patients clear of, it is the office of one of these surgeons,—the one who thinks his work is to cut and slash all the time.

The trouble with surgical dentists is that they work at the wrong end. I have treated a great number of alveolar abscesses, and I have never found but three which did not get well with the treatment I will describe.

I happen to be in a field of colleges always productive of a great deal of surgery. We have five or six colleges in active operation. Do you not pity the patients when they have to submit to so many surgical operations a day? A law prohibiting dental surgeons or surgical dentists from operating, I think, would be a good thing. It might be a hardship to those who want to practice, but it would be a great blessing to the dear people.

What is the treatment I advocate? It is simple especially simple since we have the rubber-dam, and can dry out the tooth and prevent the medicine from comin

in contact with the tissues. What is the operation? Prepare your cavity; it is not necessary to give the details, except that care must be taken not to force the breach into the pulp canal, or get the cavity clogged with foreign matter; take a piece of soft India-rubber, cut it as near the size and shape of the cavity as you can; fill the cavity with carbolic acid, place the India-rubber into the cavity, and with it force the carbolic acid out through the fistulous opening. This is readily done with a blunt instrument and sudden force against the rubber, such force as is used in packing gold by hand-pressure. In my hands this has been the most effectual way of accomplishing the treatment. One such treatment is generally sufficient.

The frequent treatments described by the former speaker as being a luxury I am inclined to think my patients would not enjoy. I may be mistaken, and if I thought they wanted the pleasure of coming often and going through all that surgery, I do not know but I could work myself up to it.

Dr. Darby spoke of a class of cases where the pulp died under an oxychloride cap, and the root was found to be dry. In such cases I think the ends of the roots become encysted, and it is better to leave them alone than to treat them.

Dr. Van Woert: When you want to be certain, you must accept the inevitable, and fall back on this old reliable agent, carbolic acid.

We are all ready to hail with delight anything that may possibly do away with the use of this offensive drug, but as yet there has been nothing presented, to my knowledge, that can take its place. Carbolic acid has made a reputation for itself that I fear it will be hard to kill. My experience with the substitutes offered, so far, has been anything but satisfactory, and I am confident that Dr. Porter will regret it if he abandons its use.

I can see no reason for leaving the root canal open. After freeing it from the septic matter with which it is clogged, it is my practice to fill at once.

I am a strong advocate of immediate root-filling in all cases, for the following reasons: When a case of apical pericementitis presents itself, or any of the difficulties following, it is plain that such is the result of one of two causes—either mechanical injury or the presence of septic matter in the roots. If the latter, by removing the cause and restoring the parts to a thoroughly aseptic condition, nature, in ninety-nine out of a hundred cases, will take up the fight and set matters straight without the aid of surgery or medicaments.

The enlargement of the apical foramen I consider, as a rule, a bad practice, but there are cases where it is permissible and even advisable. The extraction and replanting of the tooth is at times really necessary; for instance, in excessive curvature or malformation of the roots.

I am a little surprised at his reasons for performing alveolotomy. I did not suppose there were any in this advanced age of surgery who would wait for the disease to produce a fistulous opening.

I fail to quite understand his reasons for surgical treatment in chronic abscess after the canal has been filled. If he means that no medicament whatever is to be used, I cannot agree with him. On the contrary, should he mean that by gaining access for evacuating the sac by surgical means, after which medicaments are used for the treatment of the case, I fully concur with him.

The following is what I use: Iodol; 10 grains; oxide zinc, 20 grains; oil cinnamon, 5 drops; carbolate of vaseline, a sufficient quantity to form a stiff paste at 140°.

This paste is so thick and dense that it can be rolled into shape very similar to the gutta-percha points manufactured for filling root canals. It is immaterial what the temperature of the surrounding parts may be, you cannot get inflammation enough to cause the least change of the vaselin, a difficulty which I had in the beginning from macerating the mixture cold.

Another useful remedy of great service in acute peri-

cementitis is: One part tr. capsicum to two parts vin opii.

This, applied on absorbent cotton, a small piece of felt, or blotting paper, will relieve pain quicker than any local application I have ever tried.

Let me add one more word in favor of carbolic acid. In my opinion, sustained by a long experience, carbolic acid is the one of all drugs the results from which you can depend on. There has been a number of theories advanced for discarding it, one of which is the coagulation of albumen in the roots; and yet, notwithstanding this, the effect is satisfactory; and till we can prove all that is brought against it, we had best stand by it as an old friend.—*International*.

ARTICLE IV.

CURE OF NECROSIS IN THE LOWER MAXILLA.

BY T. E. LEE, M. D., D. D. S.

On the 2d of April, 1890, Bridget Clancy came to my office, Dr. A., her physician, had sent her to Dr. B., a very prominent surgeon, for advice, who in turn directed her to a dentist to have teeth extracted preparatory to having a portion of the lower jaw removed.

I learned from her the following history of the case: About the 1st of June, 1889, a large swelling appeared about one inch to the left of the symphysis of the lower maxilla. The swelling was lanced by her physician, Dr. A., who, according to the girl's statement, pronounced it a disease of the blood. I found the girl to be of a tuberculous diathesis.

After the lancing by Dr. A., a fistulous opening resulted externally. This was treated by poulticing.

cauterization, and internal or constitutional treatment from June, 1889, to April, 1890. She said that Dr. A. asserted the trouble could not possibly be from her teeth, as it was too low down on her chin. She was finally taken to Dr. B., who discovered that a large portion of the left half of the bone was necrosed, and said it would have to be removed. Carefully examining her mouth, I found the left lower cuspid and first bicuspid badly decayed with foul and decomposed pulps. The mucous membrane covering their fangs, and that in the immediate vicinity, was very much inflamed and punctured by a number of small ragged openings. The ragged edges were of proud flesh. A probe could be introduced into any of them to a considerable distance, without causing any pain. On the external surfaces of the chin and lower portion of the face somewhat similar conditions were seen. There was considerable inflammation and swelling. The large fistulous opening, and at least five smaller, the latter very similar to those found on the mucous membrane over the roots. The bone at these points seemed to be completely honey-combed. Still there was no evidence of a loosened sequestrum. I anæsthetized the patient, and extracted the two teeth described above, whose foul and poisonous pulps had caused all the trouble by percolating through the apices of the roots into the bone. The poor girl had been so deeply impressed by the belief that she would have to lose a part of her jaw, she actually dreamed, while under the anæsthetic, it was being removed.

I undertook the treatment of the case. I at once syringed very warm carbolized water through the teeth sockets and fistula. Very easily done, for on syringing the sockets the water came through the opening on the chin and *vice versa*. I ordered the application of flax seed meal poultice, to reduce the inflammation and swelling; had her return to the office about every third day for the warm water treatment, with which I sometimes used listerin instead of carbolic acid. The water was forced

through, so as to perfectly clean all accessible parts. She was directed to bathe the parts freely in warm water each night before retiring. The largest external opening was drained by means of twisted cotton for about one week. The poultices were applied four times. In the process of healing, several flaps of callus skin were left, giving rather a ragged appearance to the scar. These were clipped off closely with scissors. After having been under treatment about four weeks, the girl met with an accident by receiving a severe blow on that portion of her chin, which no doubt somewhat retarded the progress to cure. I will state I painted the parts, both externally and on the mucous membrane, frequently with equal parts of aconit, iodin and chloroform, and gave her the following as a tonic internally:

R.—Quinia sulphatis	-	-	℥j.
Ferri oxalati	-	-	℥ij.
Ext. nucis vomicæ	-	-	gr. v.

M. et ft. in pil. xx.

Sig. One an hour after each meal.

At the expiration of ten weeks I discharged her cured. The fistulous opening healing prettily, only a small dimple being left as a scar, and that almost out of sight under the chin. The case had gone on nearly a year before coming to me.

The right lower cuspid and first bicuspid were also abscessed.—*Items of Interest.*

ARTICLE V.

RESTORING THE BITE WITH GOLD CROWNS.

BY DR. H. W. ARTHUR.

Great stress is constantly laid on the careful fitting of the band; this is altogether proper, but *any* bite will do, judging from observation, so that it does not interfere with the occlusion of the other teeth. Apart from the importance to the patient of having the bite *restored*, which is accomplished by this method, the force is in the right direction, and there is no leverage exerted which has a tendency to loosen the crown and, it may be, expand a well-fitted band.

Having the band fitted and not interfering with the occlusion of the teeth, the bite is taken, preferably with modeling composition, which can be hardened with cold water while in the mouth, so that the band can be replaced exactly, should it not draw out with the impression. When in the articulator it should be an exact working bite. Place sufficient wax in the band, now in the articulator and close; this will give the bite in the wax; trim to the band, and give such artistic shape as desired, being careful to leave the bite proper intact. Remove from the articulator (this by the way, can be done more readily if the band be filled with wax, leaving only a slight rim, before placing in the articulator). Take rubber hose about an inch in length and the same in diameter; obstruct the lower half, mix and fill the upper half with Teague's Impression Compound, while in a creamy state, and imbed the wax bite till it slightly covers the band. If the depression in the bite is deep, it may be well to place a little of the compound in it first, to avoid having an air space. When set, the hand and wax bite is removed, and the compound thoroughly dried. This can be quickly

done by putting it into a melting-ladle. A change of shade all over will indicate that the moisture has been driven off. Using the rubber ring, dies are made of Melotte's fusible metal. These should be exact and well defined.

A piece of thin, pure gold plate, of sufficient size, is pressed by the fingers, and burnished on the male die, the corners clipped, ends folded in and the sides over, to prevent drawing the gold over the cusps. Strike up once on the dies, and trim off the surplus with light scissors. Place all the parts in the articulator, gold cap bite over the wax bite, close the articulator with slight pressure, burnish the cap down around the band and make sure that it is exactly in place. A trifle of flux wax may be placed where the cap and band meet. Invest, allowing the investment to touch the band at one or more points, so that should it be displaced when the wax is being removed from the inside, it may be exactly replaced. Solder and finish.

Any slight error in manipulation can be noted by placing in the articulator, and can be corrected before placing it in the mouth.—*Ohio Journal*.

ARTICLE VI.

THE KEELEY CURE.

We clip from the *Medical News* an article published by Dr. Chapman in the *Chicago Medical Recorder* of February. Dr. Chapman states that for the purpose of investigating the "cure" he obtained a position in one of the Keeley Sanitariums and carefully studied out the subject. His views as to the nature of the remedies, gained from personal experience in about three hundred cases, both in and out of the aforesaid sanitarium, are as follows:

The formulary of the gold treatment is almost, if not quite, the same in all of these institutes.

No 1. Tonic. Known in the institutes as the "dope:"

R.—Aurii et sodii chlorid, - gr. xij.
Strychninæ nitr., - - gr. j.
Atropinæ sulph., - - gr. 1-4.
Ammonii muriat., - - gr. vj.
Aloin, - - - gr. j.
Hydrastinin, - - - gr. ij.
Glycerini, - - - ʒj.
Ext. fl. cinchon. comp. - ʒ iij.
Ext. fl. coca erythrox., - ʒj.
Aquæ dest., - - - ʒj.—M.

S.—1 dram at 7, 9, 11 A. M., at 1, 3, 5, 7, 9 P. M.

No. 2. The injection known in the institutes as the "shot."

R.—Strychninæ nitr. - gr. 9 1-10.
Aquæ dest. - - ad ʒ iv.
Potass. permangan. q. s. to color. —M.

S.—Begie with gtt. 5, which equal gr. 1-40, increase one drop at each injection until the physiologic effect is produced. Four hypodermatic injections to be given daily, beginning at 8 A. M., then at 12 M., 4 P. M., and 8 P. M.

No. 3. Used with No 2:

R.—Aurii et sodii chlorid. - gr. 2½
Aquæ dest. - - ad ʒj.—M.

S.—Gtt. 3, every four hours, in combination with the strychnine solution, for the first four days.

This last prescription is used only for the moral effect, which is produced in the following manner: Five drops of the strychnine solution are drawn into the syringe, and then three drops of the gold solution are drawn in and mixed. This produces a golden-yellow color, to which attention is called, and the patient is further assured as to the reality of the presence of the gold by the stain left on the skin after the hypodermatic needle has been removed.

A positive disgust is in almost, if not in every instance, produced in the following manner: The patient is given a drink of whiskey, then the so-called bichloride of gold solution, really a solution of strychnine, is injected in his arm, but at the same time, and without his knowledge, he receives one-tenth grain of apomorphine. It takes but a comparatively short time for the emetic to produce its effects; more or less violent emesis is produced, and the patient soon associating the in-taking of the whiskey with the subsequent disagreeable and sickening vomiting, acquires a positive disgust for the liquor, and is not able to keep any on his stomach. Now he acknowledges the wonderful power of the hypothetical gold compound, and surrenders unconditionally. He is converted, and from an unbelieving scoffer is changed into a disciple and supporter of the prophet. These are the cases that are the most widely advertised, and that have done the most good for the "Keeley Institute."

It will be observed that the foregoing method is nearly the same as that quoted by us in the "Journal" of February 25th. This similarity in the testimony received from different observers inclines us to believe that both the principles on which the cure is based and the therapeutic agents used now are now known to the profession.—*Md. Med. Journal.*

ARTICLE VII.

TEETH AND TOOTHACHE.

Of teeth it may be said that that man is happiest who is unconscious of them. We do not mean as an ornament. It is true that some people, as Montaigne says, take great care to black their teeth, and hate to see them white; whilst others paint them red." Europeans have a taste of their own in the matter, and love to see them

white. For proof consult contemporary fiction *passim*, where even the villains have a fine set to show, and know it. Let Herrick sing of the rubies and pearls of his Julia's mouth; teeth for the present purpose are not jewels. They are to be regarded as the "*fons et origo mali*," and that evil is toothache.

Toothache is as old as sin, and as universal. To erring man it might figure as a form of final torture. It must have been part of the punishment of our primeval parents, whose doom we inherit. The first that an infant knows of teeth is pain; from the cradle to the grave they are an active source of annoyance. Some there be, indeed, who say not without pride that they never had a touch of toothache in their lives. But call not a man happy till he is dead. Hereafter writhing in anguish, they shall assuredly repent the premature boast. And there are strong men and the like who misuse their teeth to lift surprising weights, or, emulating that terror of the Spaniards and hero of the *Revenge* Sir Richard Grenville, chew glasses up without a grimace. "Blind mouths" (to pervert Milton's phrase), they do not look to the end—the fevered gums, the dull unceasing ache, the shooting spasm, as if a red-hot needle were thrust into the brain. If a man does altogether escape the fell disease, one is tempted to ascribe to him a low order of nervous organization. He must be "only an animal, only sensible in the duller parts." Nay, he is even lower than that, for animals, too, have toothache, and especially such as possess a high degree of intelligence. The dog and the horse are well-known sufferers. On the authority of a quaint old French book on the subject, we may add the wolf; and the hippopotamus "endures quite a great pain from its teeth, so that it is constrained to get out of the water to find a remedy."

This book is one of the earliest modern authorities on toothache that we have discovered. It is scientific, as science went in 1622. Its author, one Maistre Arnauld Gilles, was apparently court dentist for he dedicated his

book to Marie Henri'et'e de Bourbon, sister to the reigning king; and it is published at the appropriate sign of the Three Golden Teeth, in Paris. It is remarkable, we may say in passing, that the literature of toothache is so meagre. An ailment of such ancient standing in the world's history might be expected to obtain more frequent and detailed notice. Such modern treatises as exist are purely technical, and undeserving of the name of literature. There is in them nothing historical, nothing humane and sympathetic to the view of the sufferer. Even in the ordinary life of to-day there is no disease which gains us so little pity from our friends. It is not fatal, they say, and are apt to be impatient with our groans. And we ourselves, once the attack is over, straightway forget what manner of torture it was, and go unthinkingly about our daily business. Now, this is surely wrong. It may be true that toothache never killed anybody directly; but assuredly, if analogy goes for anything, it has been the cause of crime and death. Imagine an absolute monarch with an obstinate tooth. It would be a grim amusement to him, almost a necessity, to sign a death-warrant. There have been martyrs to toothache in another than the ordinary usage of the term.

But to return to Maistre Arnauld. The first thing to note is that he advises the specialization of dentistry. "It is very necessary that dentists should have no other vocation." He has known instances where patients have died from hæmorrhage because the ignorant drawer of teeth did not know how to stop the bleeding. The world, he says, by way of peroration may think the title "Drawer of teeth" strange, and perhaps despise it. But Maistre Arnauld glories in it as very useful to the public, "and does not do, like an infinity of others, who, coming to this town [of Paris], call themselves grand operators. He is happy to do his task well, to take the little fee that is given him, and is never ill-content." It is only lately that in England the Royal College of Surgeons recognized dentistry

as a special branch of medicine. Some twenty-five years ago their dental certificate was established. Before that, the craft was confined to tooth-drawing mainly, and had for its professors the local barber, blacksmith, or watch-maker. We are now beginning to see that unlicensed practitioners do a lot of mischief. The ancient Egyptians were before us in this field; for Herodotus tells us that no doctor in Egypt was permitted to practice any but his own peculiar branch, and some attended solely to diseases of the teeth. Proofs of their skill have been found in some mummies at Thebas whose teeth were stuffed with gold.

So much for the disease; but what of the cure? Maistre Arnauld gives several prescriptions, but they are commonplace compared with more ancient remedies. Here are two methods from Pliny: Put your hands behind your back; bite off a piece of wood from a tree which has been struck by lightning, and apply it to the ailing tooth. Or you may fumigate the tooth with the tooth of another of the same sex—how that is done we are not told—and bind the canine tooth of an unburied corpse to it. Habbdarrahman on Egyptain medicine advises that the molar of a dead man—whether buried or not apparently does not matter—be hung over the groaning sufferer, and the pain will abate. Others, again, say: "Burn a wolf's head and keep the ashes. They are a great remedy." It is difficult to cap the piquancy of such cures; but Sir Thomas More has done it, and his prescription has the advantage of not requiring such inaccessible materials. "I have heard it taught me," he says in 1557, "for the tooth-ache to go thrice about a churchyard and never think on a fox's tail." This reminds one in its malicious pleasantry of "Don't nail his ears to the pump"; for the suggestion of foxes' tails in connection with churchyards, though not very obvious to the common man, must always and inevitably recur to those who tried the cure.

The man in dental anguish sometimes curses with Burns "the venom'd stang that shoots his tortured gums

alang." Sometimes, on the other hand, he prays. St. Augustine in his *Confessions* relates how he once suffered from "*dolor dentium*" (toothache), apparently in an aggravated form, for he could not speak. Thereupon he wrote on wax a prayer to God for the other brethren to repeat; and as soon as all were on their knees the pain went. "But what a pain! he says—"never since my tender age had I experienced the like." Southey, in his *Life of John Wesley*, tells of that eminent preacher that when his own tooth ached he prayed, and the pain left him. Unfortunately, ordinary men do not seem to have such efficacious faith. When the excruciation begins they must bare it philosophically; and on Shakespeare's authority toothache finds out just the weak place in the philosopher's armor of patience. In the middle ages the devout who were racked with pain had a special patron to whom they could call for deliverance. St. Apollonia, a martyr under the Emperor Philip, among other cruel indignities had her teeth pulled out. In consequence, she became toothache's tutelary saint, as her emblems—one of which is "holding a tooth in pincers"—sufficiently testify. And there would seem to have been yet another martyr, St. Blaize, who took cognizance of the disease. He was honored in the little town of St. Blazey, in Cornwall, where candles offered upon his altar were supposed to be an infallible cure for toothache.

Perhaps something may be added on the subject of toothpicks. These are said to have been invented in Italy. Certainly they were in common use among the Romans. In Martial's Epigrams there are frequent references to the "*dentiscalpium*," sometimes reviling its abuse, sometimes praising its use. The particular form of tooth-pick which Martial preferred was a pointed strip of mastic-wood; but, in default of that, he recommends a quill. Singularly enough, the useful instrument was regarded as an innovation in Queen Elizabeth's time.

The Bastard, in *King John*; sneers at

Your traveller—

He and his toothpick at my worship's mess.

Travellers in France and Italy, it seems, brought tooth-picks back, and used them ostentatiously; and all those who affected foreign fashions sedulously imitated them. Commonly a case of toothpicks made of wood was carried about by fine gentlemen. A more violent eccentricity of fashion is pointed at by Sir Thomas Overbury, who describes a courtier as walking in St. Paul's "with a pick-tooth in his hat, a cape cloak, and a long stocking." Apparently the "Johnny" of the present day, who is so unremitting in his use of the homely quill, has inherited the tooth-pick and his flourishing display of it from the cock-combs that thronged the court of the Virgin Queen.—*Dominion Dental Journal*.

ARTICLE VIII.

A NEW LINING FOR VULCANITE PLATES.

BY L. CROWTHER, D. D. S., LAUREL, MD.

Rubber dam as a lining for vulcanite plates cannot be surpassed. You proceed as usual with your case and when ready for packing, first pack round the pins and flange; then cut a piece of red rubber the shape and size of your cast, large enough to come up as high as you will require your case when finished. Then lay a new cream thin piece of rubber dam on this and cut out a piece to fit, remove and paint your red plate all over with good red or black rubber solder or cement on one side, being careful that it is all covered well with the cement. Now take the piece of dam and place it smoothly on the painted side of your plate; press well down; make it quite smooth, being sure there are no air bubbles. If your dam has stretched, which it will, trim the edges to the

red plate. Place your plate in the flask so that your dam will come next your cast. When you close your flask, be sure and see that the plate comes well up round the flange so as to hug close to the model and not allow any red rubber to be forced inside. Close your case by dry heat. Use paper vacuums, and not tin as the dam will not harden over tin.

Rubber dam is better than gold for a lining as it is a non-conductor, prevents sore mouths and makes a very tough plate almost impossible to break; so you can make a thin, light piece of work.

Editorial, Etc.

A DEMONSTRATION OF HYPNOTISM.

AT THE MEETING OF THE ASSOCIATION OF DENTAL SURGEONS, OF BALTIMORE, Wm. Lee Howard, M. D., was invited to speak upon the value of hypnotism to the dental profession. We give a brief synopsis of Dr. Howard's practical talk:

Gentlemen: It is a very difficult task for me in a few minutes talk to go any further than that of giving some practical illustrations and statements of the total anæsthesia that can be produced by the physical force, misnamed hypnotism. Its interest to you solely is that by this force you can extract teeth and perform any dental operations painlessly and safely without the use of the various anæsthetics now in use. From our point of view hypnotism is soon to revolutionize the present treatment of morphiaism, alcoholism, insomnia, and the various nervous diseases. As interesting as it would be for me to explain to you the inhibitory action produced by hypnotism, its various conditions, and its universal use, at present in the large hospitals in Europe, I will confine myself to facts. Your worthy president has had a practical illustration of

its usefulness in the extraction of teeth, and with his permission I will quote his case, and then proceed to place some one in this room in a condition of total anæsthesia. The following is Dr. Twilley's case:

Dr. Twilley, with several professional friends, came to my office one evening to test the total anæsthesia produced in a patient under hypnotic influence, who had suffered from severe toothache for some time. Placing the patient in a chair I immediately put him into a deep catalepsy. Then I said, "Dr. Twilley, go ahead and extract the tooth." He approached the patient and said, "Open your mouth, please." Not getting any response he attempted to part the jaws but found them rigidly fixed. After several of the other gentlemen had tried to get some sign of consciousness without any success, I said in a decided tone of voice: "Now, open your mouth wide." He immediately obeyed. Then Dr. Twilley taking his dental forceps went to work. No gentle hand manipulated those forceps, and if ever a man attempted to torture another, Dr. Twilley certainly deserves to be entitled to that credit. After the tooth was extracted I brought the subject out from the hypnotic state and asked him if he still desired the tooth out. "No, Doctor, I think not now, it does not pain me." "Well, here it is," said Doctor Twilley holding the big molar up still grasped in the forceps. The look of surprise shown by the patient was something never to be forgotten.

In acute inflammatory rheumatism I have several times attempted to suggest the absence of pain but with very unsatisfactory results. In another case, Dr. Atkinson, Dean of the Maryland University, Drs. Finney and Baltzell of the Johns Hopkins University, Prof. Coale, Drs. Wise, Van Bibber and Kinley, made all possible tests as regards her being in a condition of total anæsthesia. The reflexes as is usual in such cases, were exaggerated, unless I desire to totally abolish them.

One of the first things I do when I wish to operate,

or produce a normal sleep, is to bring down the heart beats and rapid respirations at once to the normal conditions. One always finds rapid respiration and pulse when the subjects are first hypnotized. *Never neglect to put them in a normal condition before leaving the patient.*

In hypnotism we avoid all the disagreeable sequellæ found in the use of the various gases. I claim that almost all persons who are willing to submit to a dental operation can be hypnotized. For if they have made up their minds to take gas, or suffer, they certainly will give you their attention sufficiently for you to produce a state of hypnosis. At some other time I will gladly go into the physiological and psychological explanation of the science of hypnotism. Now let us get at the practical part of the subject.

Dr. Howard then proceeded by using some of the younger members of the society to prove that he could make them see whatever he suggested.

For reasons which will appear obvious, he did not care to place any of the members in a complete hypnosis; but walking up to a large German waiter, whom he had seen for the first time that evening, said to him, "Close your eyes!" "They are fastly closed now, you can't open them." "Try as hard as you can, you can't open them." The attempt proved useless, as the eyes seemed fastly tightened. Then Dr. Howard asking several gentlemen to take out their watches and count the pulse, ran up the heart's beats, from seventy-five to one hundred and forty, and down again to sixty, all in less than two minutes. This he did several times. After placing the heart in its normal condition, he told the man he was a log of wood and falling down. Prone on the floor fell the man, and every method taken to bring forth some signs of consciousness. Big scarf pins were thrust into his body and through the sensitive nerve endings without any more effect than would have been produced had they been thrust through the table cloth. It is interesting to note that when Dr. Howard finished, his pulse was up to one hundred and fifty beats per minute/ respiration in proportion.

UNDER the suggestive title, "The Revival of Witchcraft," Dr. Ernest Hart, the eminent English physician, contributes to the February number of the Nineteenth Century a most interesting paper describing recent tests made by him touching the genuineness of the hypnotic experiments conducted by Dr. Luys at the celebrated Hospital of La Charite in Paris. As a result of two weeks of investigation he affirms that he found "the whole series of performances to be based upon a fraud," and that he "succeeded in reproducing the phenomena without employing any occult means or invoking any new powers of mind or body." Dr. Hart recites minutely all the particulars of his investigations. His experiments embraced three classes of cases, the subjects in each were the same employed by the French physicians, and were all conducted in the presence of competent and credible witnesses, some of whom were firm believers in the marvels of the "new hypnotism," as its disciples are fond of calling it.

Dr. Hart does not charge that all the subjects were altogether imposters. Two of them "were pronounced hysterics and trained hypnotics, and mingled pathological conditions and an artificially induced state of partial automatism with their abundant frauds." Others appeared from first to last to be acting a part. Nor does he dispute the power or danger of hypnotic suggestion. The evils and abuses to which it may give rise he emphasizes very strongly. As a medical agency he sees little or nothing of value in hypnotism, its sphere, according to the best authorities, "being limited to the relief of functional disorder and symptoms in hysterical patients." In fine, he holds that "no new faculty was ever yet developed in any of these hypnotics, and that claims of this character "are for the most part demonstrable frauds, or, perhaps, in a few cases, self-deception.

THE MARYLAND BOARD OF DENTAL EXAMINERS, consisting of Drs. A. J. Volck, Wm. Oakley Haines and Cyrus M. Gingrich, of Baltimore, and Drs. E. S. Dashiell, of Snow Hill, and G. S. Fouke, of Westminster, met March 10th, and organized by the election of Dr. Volck, president; Dr. Dashiell, vice president, and Dr. Haines, secretary.

UNIVERSITY OF MARYLAND DENTAL DEPARTMENT.—
The annual commencement was held at the Academy of Music, March 16th, 1893, at 8 P. M. The mandamus from the Board of Regents was read by the Dean, Prof. Ferdinand J. S. Gorgas, M. D., D. D. S. The address to the graduates was delivered by Rev. E. L. Watson. The class oration was delivered by C. Howard Nicholson, of Canada. The degree of Doctor of Dental Surgery was conferred on the following gentlemen by Prof. I. E. Atkinson, owing to the illness of Hon. S. Teackle Wallis, LL. D., Provost of the University:

Fred. Loveland Arnold, Rhode Island; S. DeLeon Avery, South Carolina; William H. Barr, Canada; J. Edwin Boozer, South Carolina; Samuel A. Boyd, California; Samuel M. Byers, Pennsylvania; Norwood G. Carroll, North Carolina; Henry Winter Davis, Virginia; William Lee Davis, California; William W. Farmer, Virginia; Roland E. Loucke, Canada; Willie E. Minghini, W. Virginia; C. Howard Nicholson, Canada; John S. Rees, California; Thomas R. Rowe, Rhode Island; D. Fleming Sallis, Mississippi.

The new rule requiring three instead of two sessions before graduation has necessarily reduced the number of graduates this year. Last year the number was seventy three.

University prize, gold medal, for highest grade on final examination, Roland E. Loucks, of Canada; honorable mention, C. H. Nicholson, Canada.

S. S. White prize, a dental engine, H. W. Davis, Virginia; honorable mention, John S. Reese, California.

Snowden & Cowman prize, a set of Chapin A. Harris forceps, to Henry Winter Davis, of Virginia; honorable mention, John S. Reese.

The Arnold prize, set of forceps, John S. Reese; honorable mention, C. H. Nicholson.

James Hart prize, gold medal, John S. Reese; honorable mention, Roland E. Loucks.

S. S. White prize, set of Vainey's instruments, W. Lee Davis, of California, honorable mention, Samuel M. Byers, of Pennsylvania.

Prof. James H. Harris prize, gold medal, W. W. Farmer, of Virginia; honorable mention, C. H. Nicholson.

Prof. F. J. S. Gorgas prize, gold medal, N. G. Carroll, of North Carolina; honorable mention, D. E. Sallis, of Mississippi.

Dr. Frank L. Woods prize, gold medal. N. G. Carroll, of North Carolina; first honorable mention, R. E. Loucks; second honorable mention, Samuel M. Byers.

Dr. John C. Uhler prize, gold medal, Samuel M. Byers; honorable mention, John S. Reese.

Dr. Isaac H. Davis prize, gold medal, Wm. H. Barr, of Canada; honorable mention, C. H. Nicholson.

Dental department prize, gold medal, W. Lee Davis; honorable mention, R. E. Loucks.

Dr. H. E. Neiman prize, a vulcanizer, W. Lee Davis; honorable mention, Samuel M. Byers.

The prizes, except the University prize, were awarded according to the judgment of twenty-five dentists, who were invited to act as judges by the dean of the school, Dr. F. J. S. Gorgas.

THE BALTIMORE COLLEGE OF DENTAL SURGERY.—

The fifty-third annual commencement was held at Ford's Opera House, March 20th, 1893, at 2 P. M. The announcement of the graduates was made by Prof. R. B. Winder, M. D., D. D. S., Dean. The address to the graduates was delivered by Rev. H. Allen Tupper, D. D. The class oration was delivered by Robert F. Taylor, of Canada. Prof. R. B. Winder conferred the degree of Doctor of Dental Surgery upon the following gentlemen:

Maryland—Harry C. Griffith, Chas. A. Krantz, Luther M. Parsons, Frank W. Shegogue.

North Carolina—John W. Thompson.

Pennsylvania—W. H. Gregg, P. Edward Harbinson, B. F. Wendell.

New York—Chas. S. Hoose, Albert C. Hays, F. Dwight Joy, John Wood.

Vermont—Claire G. Hamilton, Andrew W. Soule.

Texas—Edward S. Rinehart, Milton S. Merchant.

Wisconsin—Francis H. Mulholland.

Canada—R. Franklin Taylor.

Germany—G. A. Hahn.

Roumania—Joseph Krainik.

The following prizes were awarded to members of the graduating class by Prof. M. W. Foster and Dr. B. Myer:

A diamond medal to Milton S. Merchant, whose grading was 59 out of a possible 60.

Gold medals—G. H. Hahn and Luther M. Parsons, whose grading was 54½. William H. Gregg received 54, Francis H. Mulholland 63½, Edwin S. Rinehart 53 and Joseph Krainik 52½, and each received honorable mention.

Operative and mechanical, Joseph Krainik; very honorable mention, J. W. Thompson.

Bridgework and essay on orthodontia, Harry C. Griffith.

DENTAL COMMENCEMENT OF MEHARRY MEDICAL COLLEGE.—The seventh annual commencement of the Meharry Dental Department, of Central Tennessee College, Nashville, Tenn., was held in connection with that of the Medical Department, February 7th, at the Gospel Tabernacle, in the presence of an audience of over three thousand people.

S. R. Thompson, of Tennessee, and A. M. Wilkins, of Georgia, were the graduates in dentistry; the valedictory address being delivered by the latter.

Seven students have been enrolled during this session.

This is the only institution in the Southern States for the education of colored dentists. The graduates of former years from this school have been well received by the white dentists of the South, and have been well patronized by their own people.

COMMITTEE ON EXHIBITS, WORLD'S COLUMBIAN DENTAL CONGRESS.—The committee on exhibits for the World's Columbian Dental Congress desires to obtain rare specimens of growths, abnormalities, casts, illustrations of methods, instruments and appliances, both ancient and modern, whereby the growth of the profession may be shown

from its early fancy up to the present time. They also desire to exhibit an ideal library, operating room and laboratory; and to this end, earnestly requests all members of the profession, together with dental dealers and publishers, to loan them any specimens, instruments, appliances, books, photographs or pictures of societies and eminent men, of all countries, together with anything and everything that will be of interest to any dentist from any part of the world. They will pay all transportation charges on such exhibits to Chicago and return, and will insure the same, while on exhibition, if desired.

Committee.—Chas. P. Pruyn, chairman, 70 Dearborn street, Chicago, Ill.; Arthur E. Matteson, 3700 Cottage Grove avenue, Chicago, Ill.; E. M. S. Fernandes, 36 Washington street, Chicago, Ill.; M. L. Rhein, 104 E. Fifty-eight street, New York; A. W. McCandless, 1001 Masonic Temple, Chicago, Ill.; R. C. Young, Anniston, Ala.; James Chace, Ocala, Fla.; W. A. Campbell, Gold and Fulton streets, Brooklyn, N. Y.

Address all communications to Dr. A. W. McCandless, Secretary, 1001 Masonic Temple, Chicago, Ill.

A MAN WHO IS FED THROUGH A FUNNEL.—The case of Mr. Jolin Tainsh, of Virginia, who has recently undergone an unusual and successful surgical operation at the Maryland University Hospital is being watched with great interest by the medical profession, and a number of physicians from other cities have come to Baltimore to examine it. Several months ago Mr. Tainsh became unable to swallow food, and for a time he was kept alive on milk, which was poured through a slender tube inserted into his throat. When brought to the hospital but little hope was at first entertained for his recovery. Dr. Louis McL. Tiffany diagnosed the case and found that the trouble was caused by the œsophagus having become choked. An operation upon the œsophagus was considered dangerous on account of the proximity of the heart, and Dr. Tiffany concluded the only way to save Mr. Tainsh from starvation was to make a new entrance to the stomach for the food.

This he did by cutting the abdomen and inserting a silver tube into the stomach. Through this tube Mr. Tainsh now receives nourishment, and he is growing strong. When he is hungry he stretches himself at full length upon his back and the physician in attendance puts a funnel to the tube and pours in milk, soup and other food. Mr. Tainsh's hunger is at once appeased by this method. He walks out every fine day.

ILLINOIS STATE DENTAL SOCIETY AND IOWA STATE DENTAL SOCIETY—JOINT MEETING.—The twenty-ninth annual meeting of the Illinois State Dental Society will be held at Rock Island, May 9-12, inclusive. The thirtieth annual meeting of the Iowa State Dental Society will be held at Davenport, May 9-12, inclusive. These cities are located on opposite sides of the Mississippi river and arrangements will be made to hold the meeting jointly, so that those in attendance at the meeting of either society will have an opportunity to listen to the papers, take part in the discussions and witness the clinics of both societies. No efforts will be spared to make this union meeting one of the most interesting in the history of each society. Members of both societies are urgently requested to attend. All dentists are cordially invited to be present. Every one should bring models, specimens, appliances or anything that may be of interest to the profession.

LOUIS OTTOFY, Secretary Illinois State Dental Society, Chicago.

W. O. KULP, Chairman Executive Committee Iowa State Dental Society, Davenport, Iowa.

Bibliographical.

A SERIES OF QUESTIONS AND ANSWERS FOR DENTAL STUDENTS. Consisting of three parts. By F. J. S. Gorgas, M.D., D.D.S. Published by Snowden & Cowman, Baltimore, and also on sale by the Wilmington Dental Manufacturing Co., Philadelphia.

This is a timely contribution to dental literature. The

first book for the Freshman's course is easily digested, but gives a good idea of the foundation work of dental knowledge in anatomy, dentition and a general training. It is a fine preparation for college life. Book second takes up these subjects in a more advanced aspect, adding two or three departments, and Book three in a still more thorough manner treats of dental pathology, oral surgery and practical dentistry. There are few practitioners who might not study all of them with interest and profit. The Freshman's course is \$2.00; the Junior's course and the Senior's course are each \$2.50.

A good idea of the scope and plan of the work may be had by the following opening page of Part First :

Question. Define anatomy?

Answer. The science relating to the structure of organized bodies.

Q. Define osteology?

A. That part of anatomy which describes the bones.

Q. Number of bones of the head?

A. Twenty-two, eight cranial and fourteen facial bones.

Q. Names of the bones of the head?

A. *Cranial*—1 frontal, 2 parietal, 1 occipital, 2 temporal, 1 sphenoid and 1 ethmoid. *Facial*—2 superior maxillary, 2 malar, 2 nasal, 1 lachrymal, 2 palate, 2 inferior turbinated, 1 vomer, and 1 inferior maxillary.

Q. Give the composition of bones?

A. Organic or animal matter and inorganic or mineral matter.

Q. Give the quantity and composition of each?

A. Organic matter about $\frac{1}{3}$, consisting of gelatin fat and vessels. Inorganic matter about $\frac{2}{3}$, consisting of phosphate and carbonate of lime (calcium), fluoride of lime, phosphates of magnesium, sodium and chloride of sodium.

Q. What does a transverse section of bone, examined microscopically show?

A. Haversian canals, canaliculi, lacunæ.

Q. What are Haversian canals?

A. Canals for the passage of vessels.

Q. What are canaliculi?

A. Minute canals connecting the Haversian canals with the lacunæ.

Q. What are lacunæ?

A. Irregular dark spaces arranged circularly around the canals and containing the bone cell.

Q. What is the medulla or marrow of bone?

A. Matter of a yellow color, consisting of fat and extractive matters, occupying the medullary canal, the cancellous texture, and the large Haversian spaces.

Q. What vessels are found in bone?

A. Arteries and veins, and according to some authorities, lymphatics.

Then follows a minute description of these processes and parts.—*Items of Interest.*

Monthly Summary.

MENSTRUATION AND THE TEETH.—In a paper on the "Influence of Menstruation on Incidents of Dental Origin," read before the Odontological Society of Paris, Prof. Sauvez shows that, since the augmentation of the mass of blood during pregnancy is known to produce certain influence on the jaws, that similar conditions existing during menstruation, women are more liable to dental troubles at that period.

On general consideration it would seem to follow that the menstrual outflow, disturbing the nervous system and manifesting itself in congestion toward the head and the organs of the chest, would naturally produce a state of least resistance in any tooth susceptible to pulpitis or periostitis.

After observing a large number of cases, the professor sums up his experience as follows:

"In her menstrual period woman is subject to affections of teeth, the same as during pregnancy, which are principally caused by the congestion of the pulp or the periosteum.

"Generally, woman may be said to be disposed to diseases of the teeth when her uterus is troubled.

"The difficulties mentioned occur at the commencement of the menstrual period."

The paper concludes with the advice that special care be exercised by practitioners; and that operation of caries in the fourth degree, for instance, shall not be attempted during the menstrual period.—*Items of Interest.*

DENTAL SCHOOL.

HOW TO SLEEP—By Pierre S. Starr, M. D., in *Working-ton's Magazine*—Nearly all the methods for inducing sleep are such as tend to withdraw blood from the brain to the skin and abdominal organs. A hot foot bath, for instance, is one of the best of the simple sedatives; a light meal on retiring, or a cracker eaten in the early morning hours when sleep has fled and is wooed in vain, often transfers the seat of activity from the brain to the stomach and brings the former organ into a state conducive to rest. In most cases, however, late suppers should be avoided.

During sleep all the functions of the body are in abeyance, the respiration is slower, the heart beats less rapidly, and digestion is delayed; food, therefore, taken just previous to sleep is apt to be undigested, fermentation results, noxious principles are absorbed, and an unrefreshing, disturbed sleep during the night and dulled faculties in the morning are the result. Light sleepers will generally find a position on the right side the most comfortable and less provocative of unpleasant dreams.

A TEMPORARY CROWN—By J. F. Simpson, D. D. S., Trenton, Ont.—Having found that a "Crown *pro tem*" is often very handy while a person is treating up a front tooth that has been broken, I use the following, which a person can make and adjust in ten minutes: Grind broken stump of natural tooth down to near gum border; take an English plate tooth that suits the space, and for a post, a stiff piece of roughened wire flattened at one end; at flattened end, file two small notches in opposite edges, for the pins of the tooth to be bent into to hold the wire firm; this makes the crown, and can be set with gutta percha or "absorbent cotton" wrapped about the wire and put up the root canal; the swelling of the cotton holds it firm in the root, and can be easily removed and reset each time we have to treat the root. Any of my patients who have had to wear this crown have been well satisfied with it. The first one I used was in the case of a gentleman who had just broken off a dead root central. I set him one, and in thirty minutes he was back at work in his store.—*Dominion Dental Journal*.



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